CALS TEST NETWORK

CTN Test Report 92-001

AITI/1139
UCRL-ID-110710

Engineering Data Transfer Test with EDCARS using MIL-R-28002 (Raster)

Laboratory Acceptance Test and User Application Test

April 17, 1992

Prepared for
Air Force Materiel Command

Prepared by
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Abstract

This paper documents the results of a sequence of tests conducted to evaluate the DoD Computer-aided Acquisition and Logistic Support (CALS) data interchange capability of the Air Force Engineering Data Computer-Assisted Retrieval System (EDCARS).

The CALS initiative specifies a standard digital interface to streamline the interchange of technical data between the DoD and the commercial sector. The CALS Test Network (CTN) is tasked to conduct tests of the military standards which specify this digital interface.

The testing results outlined in this report are intended to evaluate the EDCARS system's ability to support CALS data interchanges and establish the level of technical data interoperability implemented at this DoD engineering data repository.

Executive Summary

This report covers the Computer-aided Acquisition and Logistic Support (CALS) Test Network (CTN) Laboratory Acceptance Test (LAT) and User Application Test (UAT) of the modifications made to the Air Force Engineering Data Computer-Assisted Retrieval System (EDCARS). The modifications will allow EDCARS to interchange CALS raster image data. Demonstration modifications were implemented on three EDCARS main-frame systems, integrating CALS digital data interchange functions directly into existing EDCARS environments. The LAT was conducted on 26 and 27 February 1991 at the AT&T facility in Greensboro. The UAT was conducted on 13 March 1991 at the McClellan AFB in Sacramento, and the Follow-on Test was released for implementation at the San Antonio EDCARS facility on 18 March 1991.

CALS Test Network (CTN) LATs are conducted in a development environment and are intended as an audit of the vendor's solution strategy before committing to a field implementation. CTN UATs are targeted at production environments and are intended to assess the impact of the CALS data interchange process on the production applications. The LAT and UAT differ from most CTN testing in that they are more formal, in-depth tests, oriented to a particular application.

A performance-oriented implementation strategy, the CALS modification to EDCARS shares all the system resources with production EDCARS applications. While providing significant resources for the processing of CALS data, the impact on EDCARS production system resources (such as disk storage allocation) is not clear and will depend on the quantity of CALS data to be processed during interchange applications and EDCARS production loading.

The CTN LAT and UAT were similar processes conducted on different systems. In each case, the system being tested was provided CTN raster reference data to exercise functions associated with the interchange of CALS data tapes. After processing the reference data through the system, the data was returned to the CTN for analysis and evaluation.

The CTN had intended the testing process to provide participants with technical feedback between each test sequence. However, due to independent schedules and inter-service priority issues, the LAT and UAT chronology adopted by the three service repositories [Army Digital Storage and Retrieval Engineering Data System (DSREDS), EDCARS, and Navy Engineering Data Management Information and Control System (EDMICS)] has preempted this strategy.

The test scenarios provide raster reference data in a MIL-STD-1840A tape format and are intended to include the following activities:

1. Read CALS data into a test system.
2. Process CALS data into a native format.
3. Subject imported data items to a Quality Assurance (QA) process.
4. Convert each imported image into a bit-map.
5. Annotate (red-line) the bit-maps on the system.
6. Convert the bit-maps back to MIL-R-28002 files.
7. Write the MIL-R-28002 files to MIL-STD-1840A tape.
8. Analyze the CTN tape for CALS compatibility.

These procedures are collectively referred to as the CTN Loop-through Test. Iterations of some portions of the sequence may be required to clarify results or to accommodate and verify system adjustments. Such iterations are identified as Follow-on Tests.

Both the CTN LAT and UAT were scheduled to coincide with (and be subordinate to) the acceptance test process conducted by the EDCARS Program. During each Program test a single volume CTN reference data tape was successfully read by the CALS import utility on the system being tested.

The image files read from the CALS tape were processed, displayed, and submitted for QA during each test. EDCARS systems imposed very rigid QA requirements on both the procedural data (Hollerith card data) and image content (Group-4 encoding and image size).

The Group-4 encoding anomaly, introduced by the CTN for test purposes, was quickly uncovered by the QA utility. The QA display screen also provided visual verification that the systems were capable of decoding all the Huffman run-lengths specified by the CCITT Recommendation T.6.

Further QA processing rejected reference images larger than North American "E" drawings, due to EDCARS frame size limitations. The rest of the CTN reference data images were rejected, by the LAT and UAT during QA, for not containing EDCARS specific Hollerith data in each MIL-R-28002 file header.

The CTN was required to implement a specific subset of reference images, customized to EDCARS size and Hollerith data requirements, in order to successfully complete an anomaly free Loop-through Test. Although the EDCARS QA strategy raises procedural issues which may require some revision to accommodate inter-Service and Defense Logistics Agency (DLA) data interchanges, the current QA process is technically aligned with the CALS standards.

Subsequent analysis of the LAT, UAT, and Follow-on Tests indicated that the CALS modifications made to EDCARS were substantively capable of importing and exporting CALS MIL-STD-1840A single-volume tapes containing MIL-R-28002 Type I image data. The restriction to single-tape volumes results from the apparent inability of the systems to read or write past the End-of-Tape (EOT) reflector, precluding full implementation of the ANSI X3.27 tape standard.

While all the EDCARS tapes tested by the CTN contained minor discrepancies in procedural data:

a. Incorrect file count in a declaration file,
b. Confusing revision level identification,
c. Erroneous destination specifications,
d. Some incorrect orientation attributes,
e. Incorrectly named tape volume identifiers;

these anomalies are attributed to operation procedures as opposed to system function.

A slightly more significant issue was a tape format deviation, which occurred only in the tape returned from the San Antonio Follow-on Test. The anomaly manifested itself in short tape blocks written at the end of most image files. This tape was different from the EDCARS tapes previously tested, which contained the required 2048-byte blocking.

Short tape blocks are commonly experienced by the CTN in other developing CALS implementations and only affect CALS data interchanges with systems sensitive to short or variable length tape blocks. The CTN VAX and Sun-based Raster Test Platforms were unaffected by this format variation. The fact that the variation occurred only in the last of the EDCARS test tapes suggests that this anomaly may also be attributed to operational procedures implemented during that particular test.

Operating procedures are normally dictated by application requirements. It must be recognized that the EDCARS systems which produced the test data are not yet in a "CALS production interchange" mode and that the personnel conducting the tests were focused on the physical data interchange (data testing) issues as opposed to interchange application (data usage) issues.

The CTN data interchange scenarios are contrived to exercise the physical aspects of the interchange. The specific requirements for production data interchanges are still being developed. A good model for developing valid production requirements will be the impending digital data transfers between the Services and DLA.

The issues uncovered during the EDCARS tests are predominantly attributable to the absence of CALS interchange application requirements. The CTN recommends that production operation procedures be modeled after the development of the Consumable Item Transfer (CIT) required between EDCARS and the DLA. The CIT data interchange process should provide most of the procedural requirements germane to a CALS technical data interchange.

Additionally, the CTN recommends that the EDCARS Program Office audit the software revisions at the three test sites to assure consistency in revision levels. Corrections should be made in software or operational procedures to assure that all EDCARS systems generate full 2048-byte tape blocks.

The CTN analysis indicates that the EDCARS CALS implementation is technically capable of accomplishing CALS MIL-STD-1840A single-tape volume, MIL-R-28002 Type I, digital data interchanges with other "CALS ready" systems.

1 Introduction

The CTN participated in a sequence of tests, scheduled and conducted by the EDCARS Program Office and contractors, to evaluate and accept EDCARS modifications. The modifications are to provide EDCARS systems with the capability to import and export CALS Type I raster image data. The CTN was provided the opportunity to submit test materials, provide test procedures, and was invited to participate in the test process.

The initial testing was started at the AT&T contractor's facility and is identified in the CTN documentation as the Laboratory Acceptance Test (LAT). Further testing was scheduled at the McClellan AFB engineering data repository. This test is identified in the CTN documentation as the User Application Test (UAT). The CTN scheduled additional Follow-on Testing commensurate with the EDCARS installation in San Antonio, Texas. It was not considered necessary for the CTN to be present during the administration of the Follow-on Test. The CTN provided Loop-through data and a test scenario. The Follow-on Test was conducted by the contractor in conjunction with the EDCARS Program Office and the San Antonio repository. The resulting data was shipped back to the CTN for analysis.

The modifications required for CALS compatibility were implemented on each of the three EDCARS systems being tested. The AT&T development system had all the functional attributes of a production EDCARS system. The Sacramento and San Antonio systems were operating production systems, each functioning as part of existing Engineering Data Repositories.

The test procedures were developed by MAXIMA (the prime contractor) as required by the EDCARS contract and approved by the EDCARS Program Office. The MAXIMA test plan incorporated CTN participation but did not subordinate itself to CTN testing.

Contractor testing centered around the function and performance issues specified in the original Statement of Work (SOW). CTN testing centered around the data format issues specified by MIL-STD-1840A, MIL-R-28002, and the generic CTN test plan dated 24 December 1990. During each test, the system being tested was tasked to read, QA, process, and write the CTN raster reference data.

1.1 Background

The DoD Computer-aided Acquisition and Logistic Support (CALS) Test Network (CTN) is tasked to conduct tests of the military standard for the Automated Interchange of Technical Information (MIL-STD-1840A) and the companion specifications.

The primary purpose of the CTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the capability and operational suitability of these standards. To this end, testing should represent the systems and applications in use by government and industry. Comprehensive testing of Sub-systems and/or fully integrated Applications is intended to evaluate the readiness of a system to participate in CALS data interchanges and establish the level of capability at which these interchanges will support CALS data interoperability.

A significant near-term CALS objective is the capability of the Department of Defense (DoD) engineering data repositories to distribute, receive, and exchange engineering drawing information in a digital form. The interchange of raster image data, in accordance with MIL-STD-1840A, is the first step in meeting this objective.

Both DSREDS and EDCARS are undergoing modifications to provide the capability to accept and distribute image data in a MIL-STD-1840A form. A third system, EDMICS, was designed subsequent to the CALS standards and is expected to be "CALS ready" upon implementation.

The CTN drafted an overall test plan covering the technical issues associated with the application of MIL-STD-1840A and provided input to the designated office responsible for the preparation and execution of system acceptance testing of the DSREDS, EDCARS, and EDMICS systems. Additionally, the CTN and the National Institute of Standards and Technology (NIST) provided technical support during the testing process.

Implementing the CALS data interchange strategy between the DoD facilities and commercial vendors is an important step in demonstrating the government's commitment to establishing a standard digital interface.

1.2 Purpose

The objective of this LAT and UAT was to perform Development Level Testing and User Application Testing of the proposed EDCARS CALS modification and evaluate the CALS capability being provided. The successful completion of these tests will help assure that one of the major elements in the DoD infrastructure (EDCARS) will be capable of exchanging digital raster data using CALS standards.

The initial LAT was conducted on the contractor's development platform, the intent being to allow the test process the flexibility of accessing all aspects of the functionality being developed for integration into the EDCARS operation. The UAT was carried out on production systems to assess the impact of the modification on a production environment.

As articulated in Appendix B (CTN test procedures - EDCARS Test Script), CTN reference data was passed through each system and evaluated for structure and integrity. Additionally, native data resident on the EDCARS systems was transferred back to the CALS Test Network Office (CTNO) Test Bed at Lawrence Livermore National Laboratory (LLNL) (CTNO/LLNL) for evaluation. Analysis of the data returned to the CTN was used as an indicator of the EDCARS CALS data interchange capabilities.

2 Testing Outline

2.1 Location

Laboratory Acceptance Testing was conducted at the AT&T development facility in Greensboro, North Carolina, between 27 and 28 February 1991. Although a development system, the function exhibited by the system was identical to the EDCARS systems in the field.

The subsequent User Application Test was conducted at McClellan Air Force Base in Sacramento, California, on 13 March 1991. A Follow-on Test was conducted at the EDCARS site in San Antonio, Texas, shortly after 18 March 1991. These installations were functioning production engineering data repositories.

Analysis of the data generated by the LAT and UAT was conducted at the CTNO Raster Test Bed at the LLNL and independently by AUDRE, Incorporated, respectively located in Livermore and San Diego, California.

Group-4 conformance testing, which demonstrates the system's capability to conform to the published CCITT Group-4 data compression formats, is being conducted by NIST through an independent contractor.

2.2 Test Plan

The CALS Test Network Test Plan (24 December 1990) outlines the basic objectives and philosophy of the CTN test strategy. The DSREDS, EDCARS, and EDMICS Program Offices have jointly established a Test Team (DEETT) which, under the direction of the CTNO, developed Detailed Test Plans for the EDCARS LAT and UAT.

It was anticipated that test plans would continue to evolve up to the time of an actual test. A copy of the test scenario proposed by the CTN for each test is provided in Appendix B.

CTN testing was predicated on earlier pre-test discussions with the EDCARS Program Manager (PM) and representatives of the contractors constituting the DEETT. It is the understanding of the DEETT that the predications stipulated for the EDCARS LAT also apply to the EDCARS UAT.

The substantive issues, arising from these discussions indicated that the EDCARS system is an existing digital data system with the following capabilities:

1. Raster image scan/capture capability,
2. Raster image compression capability,
3. Raster image QA display/edit capability,
4. Image database/storage capability,
5. Image database/retrieval capability,
6. EDCARS wrap format image interchange capability.

These capabilities are in place and operational and were not intended for re-certification.

Modification of the EDCARS system has been undertaken to provide a CALS data format import/export option. The data interchange strategy was to translate CALS data into EDCARS format, entering the system, and to translate EDCARS data into the CALS format upon leaving the system.

CTN testing, in the context of this report, and as established by the DEETT, focused on the CALS data interchange functions provided by the EDCARS modification. No additional requirements were articulated by the EDCARS Program Office.

3 Test Parameters

3.1 Laboratory Acceptance Test Parameters

Dates:

27-28 February 1991

Location:

AT&T facility
Greensboro, North Carolina

Evaluators:

CALS Test Network Office Test Bed
Lawrence Livermore National Laboratory
P.O. Box 808, L-542
Livermore, CA 94550

AUDRE, Inc.
10915 Technology Place
San Diego, CA 92127

LAT Attendance:

Linda MaKinson	AT&T
Melody DeJong	AUDRE, Inc.
Nick Mitschkowetz	CTNO/LLNL
Jerry Keim	EDCARS
Jimmie Dowty	EDCARS
Gary Ellis	MAXIMA
Mike Hewitt	WESCO
David Richards	WESCO

Data types:

MIL-R-28002 Type I high-contrast binary image data representing CTN test images and selected engineering drawings from various DoD applications.

The data was presented on several MIL-STD-1840A magnetic tapes, in single- and multi-volume tape sets.

System Description:

Hardware
- AT&T IPC
- Graphics data terminals
- Magnetic tape drives
- Magnetic Disk System
- Optical Disk System

Software
- WESCO conversion
- WESCO IPL interface
- WESCO JCL for batch processing
- WESCO CLIST for selected processing
- AT&T ISR2600T import tape process
- AT&T ISR2610D import tape process
- AT&T ISR2510T import DASD process
- AT&T ISR2510D export tape process
- AT&T ISR2510D export DASD process

3.2 User Application Test Parameters

Date:

13 March 1991

Location:

McClellan AFB
Sacramento, California

Evaluators:

CALS Test Network Office Test Bed
Lawrence Livermore National Laboratory
P.O. Box 808, L-542
Livermore, CA 94550

AUDRE, Inc.
10915 Technology Place
San Diego, CA 92172

UAT Attendance:

Linda Makinson	AT&T
Melody DeJong	AUDRE, Inc.
Nick Mitschkowetz	CTNO/LLNL
Jerry Keim	EDCARS
Jimmie Dowty	EDCARS
Gary Ellis	MAXIMA
Mike Hewitt	WESCO
David Richards	WESCO

Data types:

MIL-R-28002 Type I high contrast binary image data representing CTN test images and selected engineering drawings from various DoD applications.

The data was presented on several MIL-STD-1840A magnetic tapes and was limited to single-volume tape sets.

System Description:

Hardware
- AT&T IPC
- Graphics data terminals
- Magnetic tape drives
- Magnetic Disk System
- Optical Disk System

Software
- WESCO conversion
- WESCO IPL interface
- WESCO JCL for batch processing
- WESCO CLIST for selected processing
- AT&T ISR2600T import tape process
- AT&T ISR2610D import tape process
- AT&T ISR2510T import DASD process
- AT&T ISR2510D export tape process
- AT&T ISR2510D export DASD process

4 Testing Summary

4.1 General Observations

Although conducted and summarized independently, the LAT, UAT, and Follow-on Testing activities shall be analyzed and reported in the aggregate.

The strategy undertaken to implement the CALS interchange capability for the EDCARS systems has been to design the capability as a sub-function of the Host system. The objective is a performance-oriented solution that has a rigid function intended to tightly control the import of CALS data into the EDCARS system.

The sub-function utility performs the basic format conversion between CALS and EDCARS. Once converted from CALS to EDCARS, the images are indistinguishable from native data resident in the system. Conversion from EDCARS to CALS transforms native data to CALS MIL-R-28002 Type I data which are written to MIL-STD-1840A tape for interchange purposes.

Since the solution has been implemented on the Host system CPU the import and export process are expedited, eliminating the overhead of networked connections, and sharing the Host resources with the production system. Although CPU cycles did not appear to be a major issue during the UAT, disk resources were at a premium when a large tape containing 999 images was imported into the system, as part of the Statement of Work (SOW) test.

The QA aspect of the EDCARS operation is very comprehensive, the process will explicitly reject any file that contains unacceptable data. By design, anomalous data is summarily rejected, the intent being to require external correction and resubmission by the originator. By design, EDCARS is limited to processing images no larger than North American "E" drawing frames. Larger images are rejected.

The QA terminal visually demonstrated that the system was capable of decoding and encoding all the Huffman run-lengths specified by CCITT Recommendation T.6, by correctly displaying CTN test images D001R006, D001R007, and D001R008.

The data anomaly intentionally introduced into CTN reference image D001R013 was successfully detected by the EDCARS QA process. Other unintentional anomalies, such as the CTN reference images that exceeded EDCARS image size limitations and the lack of EDCARS required Hollerith data, also contributed to the rejection of CTN reference data sets.

In addition to CTN reference data, a range of CALS formats and data variations, commonly encountered by the CTN, was provided to determine the system's sensitivity to data generated by other CALS participants. EDCARS demonstrated a narrow tolerance to both media format and Hollerith data content, rejecting all interchange data, any component of which failed to conform exactly to MIL-STD-1840A media requirements. Although EDCARS maintained a strict adherence to CALS standards, the LAT and UAT systems were unable to accept or generate multiple-tape volumes as specified by MIL-STD-1840A.

Corrections to some of the Hollerith header data were accomplished, using systems level utilities, to accommodate the EDCARS required data format during the UAT processes. However, this manual editing is not viewed as a viable solution for production data interchange activity. As a result, anomaly-free Loop-through tests were not completed during the LAT or UAT processes. However, the altered reference data that was imported during these tests and existing native EDCARS data files were converted to CALS formatted tapes for subsequent analysis by the CTN.

A Follow-on Test was scheduled to complete an anomaly-free Loop-through scenario using a specially modified CTN reference data set. The CTN generated a subset of reference images containing the appropriate EDCARS Hollerith data, the intentionally flawed image was removed, and images larger than North American "E" sizes were eliminated.

CALS tapes generated by the LAT, UAT, and Follow-on Test were analyzed by the CTNO/LLNL and AUDRE, Inc. The reader is referred to Sections 6 and 7 for analysis, conclusions, and recommendations. The individual test summaries are provided in sub-sections 4.2, 4.3, and 4.4.

4.2 Greensboro Test Summary, 26-27 February 1991

(For additional LAT information see LAT Notes in Appendix C)

Laboratory Acceptance Testing of the CALS modifications intended for implementation on the EDCARS system, was conducted on the contractor's main-frame development system. The system was configured to be functionally identical to the EDCARS systems installed in the field.

The objectives of the test were to demonstrate the function provided by the CALS modification with respect to the original Statement of Work (SOW) requirements and the CALS standards. The SOW audit was to follow an approved test plan submitted by MAXIMA while the CALS evaluation would follow the CTN EDCARS Test Script provided for the LAT (see Appendix B).

The CTN test strategy was to require that "generic" CALS data be looped through the test system, allowing the data to pass through all the standards utilities normally used in a production data interchange scenario. CALS data was to be imported, checked for accuracy, converted to the EDCARS native format and released into the EDCARS optical archive. The data loop would then be completed by retrieving the test images from optical storage, modifying selected images with a pixel editor, and exporting the images (as CALS data) back to the CTNO/LLNL for evaluation.

Some assumptions made by the CTN about the development system were invalid. The system was not flexible enough to accept generic data directly. EDCARS systems are explicitly configured to accept only image data that are specifically formatted for them. Non-conforming or anomalous data are rejected. The development system was identical to a production system; it was difficult to import or edit test data. A complete Loop-through test could not be consummated. The CTN reference data was summarily rejected during the QA process because of Hollerith data incompatibility, image size restrictions, and a premeditated Group-4 encoding anomaly. Although not inconsistent with the CALS standards, the QA strategy may make digital interchanges with foreign systems difficult.

The contractor informed the CTN that the host computer system was unable to write past the EOT reflector. Since the multi-volume ANSI X3.27 tape strategy requires this capability, multi-volume tape testing was suspended for EDCARS. The contractor's strategy for transferring large amounts of data to CALS-formatted tapes requires the system to calculate the number of files that may be written to a single tape, without encountering the End-of-Tape reflector. Successive tapes would be written until all the images were transferred to individual magnetic tape volumes.

However, certain portions of the LAT could be consummated. The CTN Raster Reference Data read from tape, although not released into the EDCARS Optical Archive, was converted from the CALS format to an intermediate format for display and QA. Additionally, as part of the SOW (contractor) test, the EDCARS system generated CALS-formatted tapes from native images retrieved from the optical archive. These tapes were provided to the CTN for MIL-STD-1840A evaluation.

Two tapes representative of newly-implemented "commercial CALS capabilities," were provided at the LAT. Although not in total alignment with MIL-STD-1840A, these data structures are indicative of those frequently encountered by the CTN and will undoubtedly be prevalent in environments that have not been tested.

The EDCARS system was able to read the CALS tapes that used the circumflex accent character "^" to pad out each image file header to full 2048 byte block. Initial difficulties in reading the CALS reference tape containing short tape blocks, after retesting, were attributed to flawed CTN tests files containing short fixed length records.

The LAT data generated by EDMICS, and evaluated by the CTNO/LLNL Test Bed, indicated that EDMICS was able to produce 9-track tapes structured commensurate with the ANSI X3.27 standard. Both the Image files and the Declaration files written to this media were in accordance with MIL-STD-1840A and MIL-R-28002A.

Initial evaluation of the interchange data content indicated that some adjustment of the EDCARS-to-CALS conversion process may be required since the Declaration file (D001) contained an improper file count and a conflicting change level parameter, while the ANSI tape label contained a non-conforming literal string.

Subsequent CTN test activities indicate that not all operating systems allow the application to control the ANSI tape label. Additionally, it should be noted that the revision level indicators applied to engineering data are typically a function of the originating engineering data management system and do not necessarily map into the parameters specified by MIL-STD-1840A

4.3 Sacramento Test Summary, 13 March 1991

(For additional UAT information see UAT Notes in Appendix C)

The EDCARS Program Office scheduled the User Application Testing of the CALS modifications at the McClellan Air Force Base EDCARS installation. The CTN had not completed the LAT analysis prior to this test. The CTN assumed that the function demonstrated at the LAT was ported to the Sacramento facility prior to the UAT.

The objectives of UAT activity are to demonstrate the CALS interchange function in a production environment. The CTN UAT activity was subordinate to the acceptance testing of the system with respect to the original SOW requirements. As in the LAT, the SOW audit was to follow an approved test plan submitted by MAXIMA, while the CALS evaluation would follow the CTN EDCARS Test Script provided for the UAT.

The CTN test strategy was similar to that used during the LAT where CALS data was looped through the test system, allowing the data to pass through all the standard utilities normally used in a production data interchange scenario. However, since the EDCARS system was severely limited in its ability to accept "foreign" (non-EDCARS) formatted data, the CTN modified header record-1 of the 18 reference data files commensurate with EDCARS Hollerith data requirements. Documentation of the EDCARS Hollerith data format was provided by MAXIMA.

This modified CALS data was to be imported, checked for accuracy, converted to the EDCARS native format, and released into the EDCARS optical archive. The data loop would then be concluded by retrieving the reference images from optical storage, modifying selected images with a pixel editor, and exporting the images, as CALS data, back to the CTNO/LLNL for evaluation.

The Hollerith modifications made by the CTN were incorrect. The FAX transmission containing the data map had apparently dropped out a line of text, causing the CTN to generate erroneous EDCARS headers. Once again the CTN test data would not pass QA to complete a Loop-through test scenario.

As in the LAT, the UAT demonstrated the EDCARS's ability to read and parse the MIL-STD-1840A single-tape volume reference data provided by the CTN. Once again, the CALS import utility was able to detect the erroneous Group-4 encoding hidden in the reference data set.

A primitive editing capability was employed to hand edit several of the reference image files to accommodate the EDCARS Hollerith requirements. These images were subsequently accepted by the QA process. Another Loop-through test was scheduled as a Follow-on Test to be conducted at the EDCARS San Antonio site.

The CALS data returned from the UAT, although not having completed the entire Loop-through scenario, had been converted from CALS format to native EDCARS format and back to a MIL-STD-1840A tape.

Analysis of the data returned from the UAT proved identical to the LAT data analysis. The MIL-STD-1840A tape structure, Declaration file structure, and the MIL-R-28002 file structures were all commensurate with the CALS standards.

The Declaration file contained the same anomalies. The revision information was ambiguous and the file count was wrong. These were undoubtedly procedural errors introduced by the operator of the CALS data interchange utility as opposed to an anomaly in the utility itself.

4.4 San Antonio Follow-on Test, 18 March 1991

(For additional Follow-on Test information see Appendix D)

The CTN corrected the EDCARS Hollerith data in the header records of each MIL-R-28002 image file in the special Raster Reference Data set and delivered a new MIL-STD-1840A tape with 15 good images to the contractor representative for the San Antonio Follow-on Test. The test was conducted by the contractor and the Loop-through data sent back to the CTN for analysis.

The analysis of the data returned from the Follow-on Test indicated a CALS data interchange capability somewhat different than the LAT and UAT. Although the MIL-STD-1840A media capability was commensurate with the earlier test results, the MIL-R-28002 image file structures were significantly different.

All the MIL-R-28002 images returned from San Antonio had been expanded out to a bit-map and edited with the character string "EDCARS REVISED." This revision or "red-line" of the images indicated that the Loop-through test scenario had been successfully undertaken.

Further analysis of the CALS data written by the San Antonio system indicated that the system that conducted the Follow-on Test had written short tape blocks at the end of almost every image file. This anomaly indicates some subtle change in system function or procedures between the Follow-on Test and the previous two tests. Although short tape blocks did not hinder either of the CTN Raster Test Platforms from processing and displaying the reference images, MIL-STD-1840A requires all tape blocks for MIL-R-28002 image files be fixed at 2048 bytes.

5 Analysis Parameters

DATES:

CTNO/LLNL	Analysis 10 May to 30 September 1991

Tools Used:

Sun 3/280

TAPETOOL	CTN UNIX tape evaluation routine
CALSTB.350	CTN UNIX CALS raster utility

DEC Micro VAX II

TAPETOOL	CTN VMS tape evaluation routine
VALIDG4	VMS CCITT Group-4 evaluator

Standards Applied:

MIL-STD-1840A
MIL-R-28002
CCITT Recommendation T.6
ANSI X3.27

6 Data Analysis

The data analysis undertaken for this report was conducted on CALS data tapes returned to the CTN from the LAT, UAT and a Follow-on Test previously described. The particular tapes being analyzed shall be referred to as tapes numbered 1, 2, and 3, respectively. Tape #1 was returned as part of the data from the LAT and is marked with an ANSI tape label of "GC0100." Tape #2 was returned from the UAT and is marked with an ANSI tape label of "BKP070." Tape #3 was returned from the Loop-through Test and is marked with an ANSI tape label of "EDCAL1."

The data from each test was generated as a result of the individual test plans and written to MIL-STD-1840A magnetic tape to be returned to the CTN. Each CALS tape set was packaged and mailed to the CTNO/LLNL separately, as proposed in the individual test scenarios (plans).

The LAT and UAT dictated that copies be sent to AUDRE, Inc. for an independent evaluation.

6.1 1840A Packaging

The three separate mailings received by the CTN were quite different in composition. The LAT data arrived in an appropriate cardboard container with the contents properly padded, marked, and enclosed in the appropriate barrier material. The outside of the container indicated the contents to be sensitive to electromagnetic emissions. A packing-slip identifying the contents and a declaration file listing was included.

The UAT and Follow-on test data did not receive quite the same attention. Most notably the outside containers were of a more flexible material with somewhat less padding. There were external markings to indicate the magnetic sensitivity of the contents. In the case of the UAT the appropriate barrier material was not included.

The CTN recognizes that MIL-STD-1840A is somewhat cryptic about the packing requirements. These requirements, which specify ASTM-D-3951, are rather obscure and not at all well known by the commercial packaging vendors contacted by the CTN. A more appropriate and well known packaging standard is Federal Specification PPP-B-636. The ambiguity presented by referencing ASTM-D-3951 and the statement that the sender should use "..best commercial practices.." requires the CTN to accept the packaging by the participants in the three tests.

The absence of a Declaration file listing with the Follow-on Test data was a less than desirable deviation of the MIL-STD-1840A. Since digital data transactions lack the tangibility of paper or microfilm, with respect to the identification of the data, it is incumbent on the participants in an electronic data interchange to provide comprehensive identification of the media being transported.

6.2 1840A Transmission Envelope

The first 40 blocks of each tape were displayed on the CTN MicroVAX (using the DUMP utility) to detect any irregularities in the ANSI X3.27 media format. Additionally, the CTN utility TAPETOOL was used on both VAX and Sun systems to parse each CALS tape. The files were loaded onto the Sun raster test bed for analysis.

Tape Formats:

All three tapes were structured in a valid ANSI X3.27 format with the appropriate ANSI file headers and trailers. However, the tape volumes were not named strictly in keeping with MIL-STD-1840A.

The intent of the six-character volume identifier is to use the last two characters as integers indicating chronology of multiple tapes in a set. These two digits are to contain either " " or "01" on the first tape.

Although the tapes tested did contain six characters that ended with digits, the names "GC01000", "BKP070", and "EDCAL1" clearly were not following the CALS strategy.

Declaration Files:

Each tape contained one set of images, requiring one declaration file per tape. The Declaration files were present and correctly structured as variable record-length files with a maximum record length of 256 data characters per record.

The content of the declaration files was less than optimum. This procedural data is application-specific and requires some detailed attention during the operation of the application.

All three transfer procedures neglected to put the appropriate file count in record 11 (filcnt:) or an appropriate revision change level in record 4, (chglvl:).

Only tape #3 indicated any concern for the use of the destination system identifier in record # 6 (dstsys:).

The expedient transfer, storage, and use of digital data will rely heavily on the procedural data that accompanies the actual technical data. Applications procedures must be developed to dictate the appropriate implementation of the procedural data types.

Image File Format:

The image files were all intact, starting with ASCII headers padded to a full 2048 bytes using "space" characters. All Group-4 encoded binary data started at the appropriate location (byte 2048).

A blocking factor of 2048 bytes was correctly implemented in tapes #1 and #2; however, tape #3 was inconsistent in this respect. Here, almost all the image files on the tape were terminated with short blocks. In each file, the last tape block was truncated after the Group-4 "end-of-code" flags.

This is a variation to MIL-STD-1840A that is not uncommon in new CALS implementations. The anomaly only causes data interchange problems when such data is read by systems which are sensitive to short tape blocks. Since this anomaly only occurred in one of the three tapes, the implication is that either the three systems are not identical in function (CALS software) or the anomaly is being introduced through inconsistent operational parameters. An audit of the software revisions installed on the three EDCARS systems involved in the testing and an audit of the operational procedures which generated the data should be conducted to resolve the issue.

Multiple Tape Volumes:

The contractor has informed the CTN that in the present systems configurations the EDCARS tape driver will not read or write past the End-of-Tape reflector. The EDCARS systems are unable to read or write multiple tape volume data as specified by ANSI X3.27.

6.3 28002A Raster Analysis

General Observations:

All the images on tapes #1, #2, and #3 were successfully decompressed and viewed on the CTN Sun Raster Test Platform, using the CALSTB.350 software utility.

Of specific interest were the native EDCARS images on tape #1 and the Loop-through test data on tape #3. Loop-through data establishes the system's ability to import and generate Group-4 image data. Exporting native data determines the operator's ability to generate the required CALS header parameters as opposed to simply regurgitating the image parameters passed to the system during the CTN Loop-through test.

The CTN activity associated with EDCARS focused primarily on data interchange issues. The existing system's imaging capabilities were not germane to this test, and were not explicitly evaluated.

Two files were selected, from the three data sets, for manual decoding of the Group-4 data. The issues here are to demonstrate that the EDCARS system is producing Group-4 data as opposed to a simple one-dimensional (single scan-line) Huffman encoded run-length scheme.

Additionally, hand decoding determines whether an optimized Group-4 compression strategy is being used such as "pass mode" limitations (as opposed to using the Published CCITT T.6 algorithm). Some variations of the basic algorithm, while not affecting compatibility with the published T.6 algorithm, are not accepted by NIST as CCITT compliant. The reader is referred to section 6.4 Hand Decoding MIL-R-28002 Files.

Specific Observations:

As with almost all the native EDCARS data on tape #1, file D001R001 had the correct file structure and header data. However, all the image files on tape #1 showed an orientation attribute of [090,270] when, in fact, files D001R018, D001R019, D001R020, should carry an attribute of [000,270] and file D001R006 should carry an attribute of [270,270].

Files Selected for Hand Decoding:

Image D001R002 was chosen from tape #3 (this is Loop-through image data returned form the San Antonio Follow-on Test.) This image originated as image D001R002 of the CTN Raster Reference Data and has been returned with the annotation "EDCARS REVIEWED" written in the title block under the image title.

The annotation is definitive proof that the reference data, sent to the San Antonio for the Follow-on Test, had been successfully decompressed into a bit-map and recompressed into a new CALS MIL-R-28002A Type I raster image file. As the hand decoding indicates, this compression is two-dimensional, that is, subsequent scan line data encodings are linked to the pixels encoded in the preceding scan line.

Image D001R001 was chosen from tape #1; this is native EDMICS data returned to the CTN from the LAT. The image is of an "A" size specification sheet. It is well presented; the image is centered, closely cropped, showing good contrast, and without excessive speckling. The image appears to be complete and does not indicate any axial misalignments or distortion. The native images, in general, spanned a quality range indicative of a production engineering image system.

6.4 Hand Decoding MIL-R-28002 Files

6.4.1 File: D001R002 Tape #3

The following hand encoding of this file indicates the required CCITT T.6 Group-4 encoding strategy has been applied, the MIL-R-28002A header data is appropriate and correctly formatted, and that the file structure is correct.

```
File Header Records:
      srcdocid:              CTNTEST02 82918 00010001UMF HN 002B
      dstdocid:              1840A Group-4 site
      txtfilid:              NONE
      figid:                 NONE
      srcgph:                NONE
      doccls:                NONE
      rtype:                 1
      rorient:               090,270
      rpelcnt:               002240,003400
      rdensty:               0200
      notes:                 EDCARS to 1840 Group-4 conversion image

File Structure:
      File Size Group-4       40960 Bytes
      File Size bit-map      952000 Bytes
      Header size              2048 Bytes
      Record Size               128 Bytes/fixed
      Header padding         "space" characters
      Last block padding       none
```

CCITT Encoding at start of file:

```
Octal:      026522           051455           051276
Binary:     0010110101010010 0101001100101101 0101001010111110
T.6:        001
            horizontal
               011010101
               makeup-white(1024)
                        0010 0101
                        terminal-white(54)
                                 0011
                                 terminal-black(5)
                                     001
                                     horizontal
                                        01101 0101
                                        makeup-white(1024)
                                                  00101011
                                                  term.-white(42)
                                                          11
                                                          term.-black(2)
                                                            1
                                                            vert(0)
                  ---------- start new scan line ----------
```

```
Octal:          046542           037026           134207
Binary:      0 0100110101100010 0011111000010110 1011100010000111
T.6:         0 01
             horizontal
                00110101
                term.-white(0)
                        10
                        term.-black(3)
                          001
                          horizontal
                             0 00111
                             term.-white(1)
                                    11
                                    term.-black(2)
                                      000010
                                      vert(-2)
                                            11
                                            vert(0) x2
                                              0 10
                                              vert(-1)
                                                  1
                                                  vert(0)
             ---------- start new scan line --------
                                                   11
                                                   vert(0) x2
                                                     0001
                                                     pass
```

CCITT Group-4 termination:

```
Binary:      0101010010010111101 0110000000000010 0000000000100000
T.6:                               0000000000010 0000000001
                                         End-of-Group-4
```

6.4.2 File: D001R001 Tape #1

The following hand encoding of this file indicates the required CCITT T.6 Group-4 encoding strategy has been applied, the MIL-R-28002A header data is appropriate and correctly formatted, and that the file structure is correct.

```
File Header Records:
      srcdocid:                STAUL 25732 38597 00010001 UMF HN 001A
      dstdocid:                1840A site
      txtfilid:                NONE
      figid:                   NONE
      srcgph:                  NONE
      doccls:                  NONE
      rtype:                   1
      rorient:                 090,270
      rpelcnt:                 002200,001728
      rdensty:                 0200
      notes:                   Sample EDCARS to 1840 conversion image

File Structure:
      File Size Group-4         26624 Bytes
      File Size bit-map        476928 Bytes
      Header size                2048 Bytes
      Record Size                 128 Bytes/fixed
      Header padding           "space" characters
      Last block padding         "^"   characters
```

CCITT Encoding at start of file:

```
Octal:      145561           127077           177777
Binary:     1100101101110001 1010111000111111 1111111111111111
T.6:        11
            vert(0) x2 --blank lines--
            ---------- new line 3 ----------
              001
              horizontal
                 0110111
                 makeup-w(384)
                        0001 1010
                             term-w(31)
                                 11
                                 term-b(2)
                                   1
                                   vert(0)
            ------------ new line 4 ------------
                                    0001
                                    pass
                                        1
                                        vert(0)
            ------------- new line 5 ------------
```

CCITT Group-4 termination:

```
Octal:      164217           040004           000100
Binary:     1110100010001111 0100000000000100 0000000001000000
T.6:                           00000000000100 0000000001
                               End-of-Group-4 code
```

7 Conclusions and Recommendations

7.1 Test Results

CTN analysis indicates that the EDCARS CALS implementation is capable of interchanging digital data with other "CALS ready" systems. However, technical issues will limit such exchanges to single magnetic tape volumes that contain Raster Type I image data with EDCARS-specific ASCII data in the first header record.

Both CTN Sun and VAX Raster Test Platforms were able to read and process all three EDCARS-generated CALS tapes, displaying the raster image content without difficulty.

The Synthetic Huffman encodings, provided in the reference data, demonstrated that EDCARS could read and write all the Huffman run-length codes required by the CCITT Recommendation T.6.

The EDCARS QA process would not allow data to be released into the EDCARS system if any required attribute failed inspection. While not lending itself to inter-Service data interchanges, this restriction does not technically preclude CALS compatibility. It simply indicates a very narrow applications focus.

Functional issues dictated that the CTN multiple-ANSI-tape volume read-and-write test be abandon due to system incompatibility. The contractor informed the CTN that the host computer operating system was incapable of writing past the ANSI end-of-tape reflector, precluding the ability to implement the ANSI X3.27 multi-volume tape strategy.

The range of CALS data interchanges is limited in scope due, in part, to the restrictive QA strategy and the limited ANSI X3.27 tape handling capabilities. EDCARS will be able to accept single-volume tape CALS interchanges if the MIL-R-28002 header data contains Hollerith data conforming to EDCARS requirements.

Since the LAT, UAT, and Follow-on Tests were performed so close together, it was not possible to modify procedures or system function for one, based on previous results of another. However, results from the three tests indicated that no major technical issues were outstanding to prevent EDCARS from importing and exporting CALS data, within the confines of a single tape.

The procedural discrepancies uncovered included Declaration files containing incorrect file counts, confusing revision level indicators, and erroneous destination parameters. Additionally, some image files contained incorrect orientation parameters. Currently the EDCARS image process does not support variation in image orientation parameters.

Functionally, the EDCARS data processing sequence precludes the insertion of the appropriate image file count parameter in the Declaration file and the AT&T operation systems controls literal string written to the ANSI tape label, precluding the CALS label requirement.

Additionally, Tape #3, which was returned from the Follow-on Test, contained short tape blocks at the end of most image files, indicating that procedural or functional differences exist among the EDCARS implementations.

Although these variations do not coincide with the MIL-STD-1840A strategy, they did not preclude the CTN Test Beds, the Army DSREDS system, or the Navy EDMICS system from successfully importing EDCARS produced CALS tapes.

7.2 Observations

Implementation Performance:

The EDCARS modifications to process CALS raster image interchanges had been implemented on the EDCARS host computer. The resources of the production EDCARS image system are shared with this new capability, expediting the CALS data conversion process.

The implementation strategy provided significant resources for the processing of CALS data and did not appear to impact the EDCARS production processing capabilities during the UAT. However, available disk storage space may be an issue in a fully loaded environment, depending on the characteristics of production CALS data transactions.

Implementation Flexibility:

"The systems were designed with very limited capability for run-time correction of operational anomalies involving foreign (non-EDCARS specific) data interchanges." A capability was provided for correcting non-key Hollerith data. This capability was not useful in correcting the data from the CTN tapes and will probably not be very useful in a production environment.

The EDCARS data import strategy imposes rigid QA requirements on both the procedural data (Hollerith card data) and the image content (Group-4 data). The QA process requires an explicit Hollerith data format and is sensitive to Hollerith data content and values. Other QA strategies attempt to evaluate image compression by comparing file size to image format area and resolution.

The QA process may pose a significant barrier to interchange data that does not conform exactly to the EDCARS import requirement. Circumventing these QA barriers requires a level of systems sophistication far exceeding that of the operations staff. In a data interchange environment that is still being developed, where procedures and requirements for digital data interchanges are still being identified, such a QA strategy is less than optimum.

The EDCARS system may require additional modifications to facilitate the interchange of CALS data with DLA and the other service repositories.

Procedural Issues:

It should be recognized that the implementation of operating procedures is governed by the applications which require a digital data interchange. Since no explicit CALS applications (other than CTN testing) have been identified, the operational requirements and procedural aspects of an EDCARS/CALS data interchange should remain flexible.

The CTN test scenarios are somewhat contrived with respect to procedural requirements. The focus of these tests are the link-level interchange issues associated with media and file formats, as opposed to operation and application related parameters such as Hollerith data content, file counts, and image orientation.

However, the implementation of those parameters is an integral part of operating an Image system. To successfully use CALS data in a specific application, such as the DLA Consumable Item Transfer, will require that these parameters be available to the CALS conversion process.

Since CALS data interchanges have not been a typical function performed by EDCARS operators, the CTN presumes that the implementation of those parameters will be undertaken through operational procedures implemented for a specific CALS data interchange applications.

Operational Issues:

It is anticipated that the CALS utilities are functionally identical at the various EDCARS sites. However, some part of the data interchange process may be implemented using existing systems utilities which can provide varying results depending on operational procedures. Although inconsistencies in the EDCARS data content can be attributed to such operational flexibility, it is somewhat more difficult to reconcile the tape blocking factor anomaly manifested on tape #3.

The CTN assumes that the EDCARS Program monitors the implementation of software changes to the various systems. If the software at the Follow-on Test site is the same as that used at the LAT and UAT sites, then the tape blocking anomaly is an operational issue. Otherwise, the San Antonio system may not have the same function as the Greensboro or Sacramento systems.

7.3 Recommendations

The CTN recommends that, before further data interchange activities are conducted by EDCARS, the procedures required to generate CALS data be established and provided in a production-oriented checklist for use by operations personnel. An applications model may be developed by outlining the requirements for data interchanges between EDCARS systems and DLA.

Additionally, the CTN recommends that the EDCARS program audit the software revisions at the three test sites to assure their coincidence.

APPENDIX A AUDRE, Inc. Test Report

Note: Appendix A contains an independent analysis of the EDCARS-generated CALS tapes done by AUDRE, Inc. Their report, along with its three attachments, is inserted as received by CTNO/LLNL, without modification or editing.

1.0 INTRODUCTION.

AUDRE, Inc. participated in the evaluation process as an independent observer with commercial raster experience. The evaluation process consisted of on-site testing and evaluation, and an off-site audit on two sets of data. On-site EDCARS user application testing occurred March 13, 1991 at the McClellan AFB facility in Sacramento, California. The purpose of this testing was to demonstrate user application of the modified EDCARS system. As a member of the CTN test team, AUDRE, Inc. was tasked to observe the physical testing and to comment on productivity issues which could possibly arise. In addition, AUDRE, Inc. was asked to audit the results of the Data Interchange Process. During this audit two test tapes were evaluated for compliance to MIL-STD-1840A and MIL-R-28002 specifications.

2.0 METHODOLOGY.

In order to conduct this audit, preliminary preparation was required to become familiar with LLNL/CTN raster test node. All standards, specifications and other pertinent reference material were collected and organized to create an in-house CALS library. All test plans were studied; standards and specifications were reviewed in detail. In addition, in-house batch software routines for automated data testing and analysis for CALS compliance were built. The results of this audit are discussed as follows.

a. On-site testing.
b. MIL-STD-1840A (February 27, 1991 Pre-test data) validation and verification issues.
c. MIL-R-28002 (February 27, 1991 Pre-test data) validation and verification issues.
d. MIL-STD-1840A (March 27, 1991 Post-test data) validation and verification issues.
e. MIL-R-28002 (March 27, 1991 Post-test data) validation and verification issues.

The following attachments are made a part of this appendix:

Attachment 1 - MIL-STD-1840A Validation program (February 27, 1991 Pre-test data).
Attachment 2 - MIL-R-28002 Validation program (February 27, 1991 Pre-test data).
Attachment 3 - Visual Analysis of images (February 27, 1991 Pre-test data).
Attachment 4 - MIL-STD-1840A Validation program (March 27, 1991 Post-test data).
Attachment 5 - MIL-R-28002 Validation program (March 27, 1991 Post-test data).
Attachment 6 - Visual Analysis of images (March 27, 1991 Post-test data).

3.0 ON-SITE TESTING.

Two contractors, Maxima and AT&T, were responsible for conducting the test. The on-site Acceptance Test Plan, submitted by AT&T to Maxima, provided procedures to verify that the CALS conversion software added to the EDCARS system met previously defined objectives. The CTN test objective was to ensure that the changes to EDCARS provided a CALS data format import/export facility. Although the CTN test team provided a testing script, the more thorough Acceptance Test Plan provided by AT&T was implemented. The CTN test team observed and audited the testing for the following: (a) to ensure that CALS data could be imported from the MIL-STD-1840A transmission envelope, (b) the raster data could be accessed and altered within the EDCARS system, and (c) the data could be exported to a MIL-STD-1840A 9-track tape.

3.1 Testing.

Two sets of tests were performed, one using native EDCARS data, the other using CALS data. The CTN tape was read in successfully and the flawed data file (13) was found. All files were decompressed, then compressed and compared against the other files. The comparison apparently failed at the Hollerith data in the header files and in the padding found at the end of the encoding. These difference do not indicate non-CALS compliance.

The flawed data file created a problem in importing the files. The EDCARS/CALS system is designed to prohibit erroneous data from being entered. This is a safety precaution, however it is too prohibitive to disallow all the data. Perhaps a modified system could flag the erroneous data and continue with the good data when permission is given by the user. For testing purposes this issue was circumvented by importing data in two batches. Other restrictive issues arose during the importing of the tapes. The document numbers were missing from the CTN files and were rejected again. When the numbers were inserted manually, all but two of the remaining files were successfully brought into the EDCARS system. The two files which could not be brought in were a J-size file and an E ISO-size file. These restrictions are inherent to the size limitations of the EDCARS system and were not deemed to prevent the system from being CALS compliant.

Once the data was brought into the system, the files were red-lined to demonstrate that the data could be accessed within the EDCARS environment. The files were exported as MIL-R-28002 files onto a MIL-STD-1840A tape which was sent to AUDRE, Inc. for further testing.

3.2 Discussion.

On-site testing demonstrated that correct CALS MIL-STD-1840A/MIL-R-28002 data could be received and generated by the EDCARS system. The prohibitive nature of receiving data is a safety issue and although restrictive, does not prevent erroneous data from corrupting the EDCARS database.

All CALS modifications are embedded within the EDCARS system. This eliminates bottlenecks posed by adding extra peripherals. Depending upon the usage of the system as a CALS MIL-STD-1840A import or export site, it may be necessary to add low-cost peripherals such as tape drives and display devices for quality assurance (QA) to prevent the EDCARS system from being bogged down with basic I/O and QA requirements.

4.0 OFF-SITE TESTING.

Two EDCARS tapes were received and tested off-site. The first tape was generated on February 27, 1991 prior to the testing and the second tape was generated on March 27, 1991 following the testing. Both were audited, although only testing of the second was required.

5.0 PRE-TEST DATA ANALYSIS (February 27 generated data).

5.1 MIL-STD-1840A PACKAGING.

The shipping box contained one 9-inch reel of 9-track magnetic tape. The method of packing was adequate to protect the contents. The tape was labeled TP06C1 although the actual tape volume identifier was TP006C. In addition, MIL-STD-1840A specifies in paragraph 5.3 that a packing slip should be provided which indicates the name and volume number, the recording density, and a printed listing of the declaration files. This information was not provided.

5.2 MIL-STD-1840A TESTING PROCESS (EDCARS1).

The contents of the tape was indexed in accordance with paragraph 5.1 File Structure for transfer and paragraph 5.2.1.1 Volume Identifier. Analysis of the volume identifier, "TP006C", showed that the tape number, "6C" fails the 5.2.1.1 validation criteria. The tape number may not contain any characters, and because this is the first tape in the set, the tape number must be "01" or space characters.

The declaration file, D001, was read from the tape and its contents printed. Analysis of the print out verified that there were no errors in the file name as specified by paragraph 5.1.1.1 Declaration File Name. However, the contents of the declaration file did contain two errors. First, in record 4, it was not clear whether the change level should be ORIGINAL or whether a revision, change level and date were intended since both types of data appeared. Second, in record 11, the filcnt was 999. This count did not match the total number of data files contained on the tape which was 20. Because of these two errors, the contents of the declaration file fails the validation criteria specified by paragraph 5.1.1.2. Further analysis showed that the declaration file complies with paragraph 5.2.1.3 Declaration File.

As specified by paragraph 5.1.3 the data file names were checked and found to contain valid file names. The data files were read from the tape and each file verified for compliance with MIL-STD-1840A paragraph 5.1.4.4 Raster Data File Header Records, and paragraph 5.2.1.6 Raster

Files. Each data file header record was extracted, printed and verified as to proper format and content. Specifically, the data file header records were checked for form only and the actual analysis of the contents of the CCITT data and records 7, 8, 9 and 10 were verified as part of MIL-R-28002 testing. All data file headers were successfully extracted and all records were present in the data file header records. There were no format errors in any of the data file header records.

5.2.1 Summary of MIL-STD-1840A Compliance.

The volume identifier and records 4 and 11 from the declaration file contents violate the requirements specified by paragraphs 5.2.1.1 and 5.1.1.2 respectively. The packaging did not comply with paragraph 5.3.1. Other than these, the rest of the data complies to MIL-STD-1840A.

5.3 MIL-R-28002 TESTING PROCESS.

MIL-R-28002 testing includes both automated and visual testing. Attachment 2 contains the log of the automated testing, which includes the checks on records 7, 8, 9, and 10 of the data file headers and especially the CCITT Group 4 encoding. Attachment 3 contains the results of the image analysis.

5.3.1 Automated Testing.

The first step in MIL-R-28002 testing uses automated testing to verify Group 4 data. All raster files on the tape (Volume ID: "TP006C", Owner ID: "EDCALS") contained valid Group 4 data and were converted to bit maps successfully.

Records 7, 8, 9, and 10 were checked for compliance on all files. All files specified raster Type I data in record 7 and valid raster Type I data was verified on all files. Record 8 was verified in all files as to permissible pel path and line progression values, but were not checked for consistent values in the header and image file. This was scrutinized later during visual testing procedures, see paragraph 5.4 below. Record 9 was examined to ensure that the image width and height contained positive integer values, represented the actual width and height and that it conformed to the recommended values in the standard. The files D001R001, D001R002, D001R003, D001R004, D001R006, D001R007, D001R014, D001R015, D001R018, D001R019 and D001R020 did not conform to the recommended values for North American or metric size drawings. This was considered a minor detail and flagged as a warning only. The density found in record 10 was 200 in all the files and is considered a permissible and correct value.

All automated testing demonstrated valid MIL-R-28002 files.

5.4 Visual Testing.

The second step in MIL-R-28002 testing was visual. The correct decoding of Group 4 data was verified visually on all files by looking for data irregularities, such as premature end of file, odd inclusions, etc. Based on this inspection, all files were decoded correctly without error.

Verification of correct image orientation values as given in record 8 were checked visually. Four files, D001R006, D001R018, D001R019 and D001R020 were found to have different orientations from those specified in the file headers. Record 8 in each of these four files was defined as "rorient: 090,270" which specified a pel path of 90 and a line progression of 270. The actual data for D001R006 record 8 should have read "rorient: 270,270" which specifies a pel path of 270 and a line progression of 270. Also, the actual data for D001R018, D001R019 and D001R020 record 8 should have read "rorient: 000,270" which specifies a pel path of 0 and a line progression of 270. Although the values given in record 8 for each of the four files were permissible values, they did not correspond to the actual data found in the images.

A visual quality assurance (QA) check was performed to assess the scan quality of the images. The results of this check, shown in Attachment 3, are provided for informational purposes only and do not impact MIL-R-28002.

The files D001R002, D001R005, D001R006, D001R010, D001R015, D001R018, D001R019 and D001R020 all contained noticeable levels of noise. Excess noise present on an image severely increases valuable storage requirements. A simple extraneous pixel removing routine was run on all the drawings to remove random pixels from the raster data. The filter was set to remove most of the noise and yet retain all pertinent information. The above eight files were reduced in size by more than eight percent. Files D001R018, D001R019 and D001R020 were decreased by over 20 percent; D001R002 and D001R005 decreased by over 15 percent; D001R010 and D001R015 by over 10 percent. Attachment 3 lists the percentage decrease of all the drawings.

It was observed that files D001R005, D001R006, D001R007, D001R008, D001R009, D001R010, D001R012, D001R013, D001R014 and D001R015 contained some text that was illegible or unreadable. Files which contain illegible text are considered to be undesirable in quality and may not be worth keeping in the EDCARS archival system.

Four files were noticeably skewed in either vertical or horizontal direction by approximately one degree. It is recommended that the files D001R001, D001R002, D001R007 and D001R009 be rescanned to correct the skew.

5.5 Summary of MIL-R-28002 Compliance.

Automated testing demonstrated that all files on the tape were valid MIL-R-28002 files. Group 4 decoding was found to be valid both digitally and visually. The four orientation errors that were flagged should be corrected. In general, files that are of undesirable quality should be rescanned if they are to be archived the EDCARS system, although this does not affect compliance.

6.0 POST-TEST DATA ANALYSIS (March 27 generated data).

6.1 MIL-STD-1840A PACKAGING.

The shipping box contained one 9-inch reel of 9-track magnetic tape. The method of packing was adequate to protect the contents. The tape was labeled with the correct tape volume ID, name and density. However, paragraph 5.3.1 specifies that a printed listing of the content of the included declaration files should also be provided.

6.2 MIL-STD-1840A TESTING PROCESS (EDCARS2).

The contents of the tape was indexed in accordance with paragraph 5.1 File Structure for transfer and paragraph 5.2.1.1 Volume Identifier. Analysis of the volume identifier, "BKP009", showed that the tape number, "09" fails the validation criteria set forth in paragraph 5.2.1.1. The tape number may not contain any characters, and because this is the first tape in the set, the tape number must be "01" or space characters.

The declaration file, "D001" was read from the tape and the contents printed. Analysis of the print out verified there were no errors in the file name as specified in paragraph 5.1.1.1 Declaration File Name. However, the contents of the declaration file contained two errors. First, in record 4, it was not clear whether the change level should be ORIGINAL or whether a revision, change level, and date were intended since both types of data appeared. Second, in record 11, the filcnt was 999. This count did not match the total number of data files contained on the tape which was 15. Because of these two errors, the contents of the declaration file fails the validation criteria specified by paragraph 5.1.1.2. Further analysis showed that the declaration file complies with paragraph 5.2.1.3 Declaration File.

As specified in paragraph 5.1.3 the data file names were checked and found to contain valid file names. The data files were read from the tape and each file verified for compliance with MIL-STD-1840A paragraph 5.1.4.4 Raster Data File Header Records, and paragraph 5.2.1.6 Raster Files. Each data file header record was extracted, printed and verified as to proper format and content. Specifically, the data file header records were checked for form only and the actual analysis of the contents of the CCITT data and records 7, 8, 9 and 10 were verified as part of MIL-R-28002 testing. All data files headers were successfully extracted and all records were present in the data file header records. There were no format errors in any of the data file header records.

6.2.1 Summary of MIL-STD-1840A Compliance.

The volume identifier and records 4 and 11 from the declaration file contents violate the requirements specified by paragraphs 5.2.1.1 and 5.1.1.2 respectively. The packaging did not fully comply with paragraph 5.3.1. Other than these, the rest of the data complies to MIL-STD-1840A.

6.3 MIL-R-28002 TESTING PROCESS.

MIL-R-28002 testing includes both automated and visual testing. Attachment 5 contains the log of the automated testing, which includes the checks on records 7, 8, 9, and 10 of the data file headers and especially the CCITT Group 4 encoding. Attachment 6 contains the results of the image analysis.

6.3.1 Automated Testing.

The first step in MIL-R-28002 testing uses automated testing to verify Group 4 data. All raster files on the tape (Volume ID: "BKP009", Owner ID: "EDCALS") contained valid Group 4 data and were converted to bit maps successfully.

Records 7, 8, 9, and 10 were checked for compliance on all files. All files specified raster Type I data in record 7 and valid raster Type I data was verified on all files. Record 8 was verified in all files as to permissible pel path and line progression values, but were not checked for consistent values in the header and image file. This was scrutinized later during visual testing procedures. Record 9 was examined to ensure that the image width and height contained positive integer values, represented the actual width and height and that it conformed to the recommended values in the standard. The files D001R006, D001R007, D001R008, D001R009, D001R010, D001R011, D001R012, D001R013 and D001R014 did not conform to the recommended values for North American or metric size drawings. This however, was considered a minor detail and flagged as a warning only. The density found in record 10 was 200 in all files and is considered a permissible and correct value.

All automated testing demonstrated valid MIL-R-28002 files.

6.4 Visual Testing.

The second step in MIL-R-28002 testing was visual. The correct decoding of Group 4 data was verified visually on all files by looking for data irregularities, such as premature end of file, odd inclusions, etc. Based on this inspection, all files were decoded correctly without error.

Verification of correct image orientation values as given in record 8 were checked visually. One file, D001R013, was found to have a different orientation from that specified in the file header. Record 8 in this file was defined as "rorient: 090,270" which specified a pel path of 90 and a line progression of 270. The actual data for D001R013 record 8 should have read "rorient: 000,270" which specifies a pel path of 0 and a line progression of 270. Another file, D001R006, had its record 8 defined also as "rorient: 090,270". Visually it was not clear as to what the orientation should be for this file. The values which were given in record 8 of these two files were permissible values, however D001R013 did not correspond to the actual data found in the images.

A visual quality assurance (QA) check was performed to assess the scan quality of the images. The results of this check, shown in Attachment 6, are provided for informational purposes only and do not impact MIL-R-28002.

The files D001R002, D001R003, D001R004, D001R005 and D001R007 all contain noticeable levels of noise. Excess noise present on an image severely increases valuable storage requirements. A simple extraneous pixel removing routine was run on all drawings to remove random pixels from the raster data. The filter was set to remove most of the noise and yet retain all pertinent information. The above five files were reduced in size by more than 10 percent. File D001R007 was decreased by over 30 percent; D001R002, D001R003, D001R004, D001R005 by over 10 percent. Attachment 6 lists the percentage decrease of all the drawings.

It was observed that files D001R002 and D001R004 contained some text that was illegible or unreadable. Files which contain illegible text are considered to be undesirable in quality and may not be worth keeping in the EDCARS archival system.

There was no noticeable skewing defects in any of the files.

6.5 Summary of MIL-R-28002 Compliance.

Automated testing demonstrated that all the files on the tape were valid MIL-R-28002 files. Group 4 decoding was found to be valid both digitally and visually. The one orientation error flagged should be corrected. In general, files that are of undesirable quality should be rescanned if they are to be archived in the EDCARS system, but this does not affect compliance.

```
*****************************************************************
*                                                               *
*                  MIL-STD-1840A VALIDATION                     *
*                                                               *
*  The program scans and validates the contents of a magnetic   *
*  tape for compliance to the MIL-STD-1840A standard.           *
*                                                               *
*                                                               *
*****************************************************************

    ****************************************************
    *                                                  *
    *   SCAN THE MIL-STD-1840A CALS TAPE               *
    *                                                  *
    ****************************************************

rwmt -index

Volume label:
    Volume ID: "TP006C"    Owner ID: "EDCALS        "    Access: " "
```

File/Section	File ID	Cr Date	Acc	RF	RL	BL
1 1	D001	91/02/27		D	256	2048
2 1	D001R001	91/02/27		F	128	2048
3 1	D001R002	91/02/27		F	128	2048
4 1	D001R003	91/02/27		F	128	2048
5 1	D001R004	91/02/27		F	128	2048
6 1	D001R005	91/02/27		F	128	2048
7 1	D001R006	91/02/27		F	128	2048
8 1	D001R007	91/02/27		F	128	2048
9 1	D001R008	91/02/27		F	128	2048
10 1	D001R009	91/02/27		F	128	2048
11 1	D001R010	91/02/27		F	128	2048
12 1	D001R011	91/02/27		F	128	2048
13 1	D001R012	91/02/27		F	128	2048
14 1	D001R013	91/02/27		F	128	2048
15 1	D001R014	91/02/27		F	128	2048
16 1	D001R015	91/02/27		F	128	2048
17 1	D001R016	91/02/27		F	128	2048
18 1	D001R017	91/02/27		F	128	2048
19 1	D001R018	91/02/27		F	128	2048
20 1	D001R019	91/02/27		F	128	2048
21 1	D001R020	91/02/27		F	128	2048

```
    ******************************************************
    *                                                    *
    *  VERIFY SECTION 5.2.1.1 Volume Identifier          *
    *                                                    *
    ******************************************************

Volume Identifier : "TP006C"
 Check 1: the tape volume identifier, "TP006C" is six characters.
 Check 2: the first character "T" is not a number.
 Check 3: the tape number, "6C" starts at 6C.
ERROR! the tape number, "6C", must be "01" or space characters.
 Check 5: all characters in "TP006C" are limited to the ASCII
          numbers 0-9 and the upper-case letters.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *  VERIFY SECTION 5.1 File structure for transfer    *
    *                                                    *
    ******************************************************

 Check 6: There is one declaration file, "D001".
 Check 7: There exists at least one data file.
 Check 8: The declaration file, "D001", does precede the data files.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *            READ THE DECLARATION FILE               *
    *                                                    *
    ******************************************************

 rwmt -r -f 1 D001 -rf d
     15 records read from tape file #1 into "D001".

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DECLARATION FILE     *
    *                                                    *
    ******************************************************

catf D001

srcsys: West Coast Information Systems, Inc
srcdocid: To Be Assigned
srcrelid: NONE
chglvl: ORIGINAL, 14576120127
dteisu: 19910127
dstsys: AT&T - LAT site
dstdocid: To Be Assigned
dstrelid: NONE
dtetrn: 19910127
dlvacc: NONE
filcnt: R999
ttlcls: Unclassified
doccls: Unclassified
doctyp: Unclassified
docttl: Conformance Test Package

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *  VERIFY SECTION 5.2.1.3 Declaration File           *
    *                                                    *
    ******************************************************

 Check 9:  the declaration file, "D001", consists of sequential
           variable length records.
 Check 10: the records are all of ANSI type D (variable).
 Check 11: the maximum record length is 256 bytes.
 Check 12: each block is 2048 bytes.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.1.1 Declaration File Name              *
    *                                                    *
    ******************************************************

Verifying Declaration File Name, "D001"

 Check 13: "D001" is four characters in length.
 Check 14: the first character of "D001" is a "D".
 Check 15: the next three characters in "D001" are ASCII
           numbers between 001 to 999.

------------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.1.2 Declaration File Content         *
    *                                                  *
    ****************************************************

Verifying the Contents of the Declaration File, "D001"

Record 1. - Source system (srcsys:).

"srcsys: West Coast Information Systems, Inc"

 Check 16: the "srcsys: " record is present.
 Check 17: "West Coast Information Systems, Inc" follows the "srcsys:" record.

Record 2. - Source system document identifier (srcdocid:).

"srcdocid: To Be Assigned"

 Check 18: the "srcdocid: " record is present.
 Check 19: "To Be Assigned" follows the "srcdocid: " record.

Record 3. - Source system related document identifier (srcrelid:).

"srcrelid: NONE"

 Check 20: the "srcrelid: " record is present.
 Check 21: "NONE" follows the "srcrelid: " record.

Record 4. - Highest revision and change level in the document
            (chglvl:).

"chglvl: ORIGINAL, 14576120127"

 Check 22: the "chglvl: " record is present.
ERROR! date must be in YYYYMMDD format.
Record 5. - Date of issue of the latest change to the document
            (dteisu:).

"dteisu: 19910127"

 Check 24: the "dteisu: " record is present.
 Check 25: the date, 19910127, is provided in YYYYMMDD format.

Record 6. - Destination system (dstsys:).

"dstsys: AT&T - LAT site"

 Check 26: the "dstsys: " record is present.
 Check 27: "AT&T - LAT site" follows the "dstsys: " record.
```

```
Record 7. - Destination system document identifier (dstdocid:).

"dstdocid: To Be Assigned"

 Check 28: the "dstdocid: " record is present.
 Check 29: "To Be Assigned" follows the "dstdocid: " record.

Record 8. - Destination system related document identifier
            (dstrelid:).

"dstrelid: NONE"

 Check 30: the "dstrelid: " record is present.
 Check 31: "NONE" follows the "dstrelid: " record.

Record 9. - Date of transfer (dtetrn:).

"dtetrn: 19910127"

 Check 32: the "dtetrn: " record is present.
 Check 33: the date, 19910127, is provided in YYYYMMDD format.

Record 10. - Delivery accounting (dlvacc:).

"dlvacc: NONE"

 Check 34: the "dlvacc: " record is present.
 Check 35: "NONE" follows the "dlvacc: " record.

Record 11. - File count (filcnt:).

"filcnt: R999"

 Check 36: the "filcnt: " record is present.
 Check 37: the letter "R" immediately follows the record.
 Check 38: the file count, 999, follows the "R" with no spaces
           between the count and the character.

ERROR! count of data files do not match actual count.
Record 12. - Title Security Label (ttlcls:).

"ttlcls: Unclassified"

 Check 39: the "ttlcls: " record is present.
 Check 40: "Unclassified" follows the "ttlcls: " record.

Record 13. - Document Security Label (doccls:).

"doccls: Unclassified"

 Check 41: the "doccls: " record is present.
 Check 42: "Unclassified" follows the "doccls: " record.
```

```
Record 14. - Document Type (doctyp:).

"doctyp: Unclassified"

 Check 43: the "doctyp: " record is present.
 Check 44: "Unclassified" follows the "doctyp: " record.

Record 15. - Document Title (docttl:).

"docttl: Conformance Test Package"

 Check 45: the "docttl: " record is present.
 Check 46: "Conformance Test Package" follows the "docttl: " record.

-------------------------------------------------------

    ****************************************************
    *                                                  *
    * Section 5.1.3  Data File Name                    *
    *                                                  *
    ****************************************************

Verifying the Names of the 20 data files

"D001R001"
 Check 47: "D001R001" is eight characters long.
 Check 48: the first four characters of "D001R001" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R001" is the letter "R".
 Check 50: the last three characters of "D001R001" are "001",
           a decimal number from "001" to "999".
 Check 51: "D001R001" is the number  1 data file for the document
           and correctly uses "001".

"D001R002"
 Check 47: "D001R002" is eight characters long.
 Check 48: the first four characters of "D001R002" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R002" is the letter "R".
 Check 50: the last three characters of "D001R002" are "002",
           a decimal number from "001" to "999".
 Check 51: "D001R002" is the number  2 data file for the document
           and correctly uses "002".

"D001R003"
 Check 47: "D001R003" is eight characters long.
 Check 48: the first four characters of "D001R003" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R003" is the letter "R".
 Check 50: the last three characters of "D001R003" are "003",
           a decimal number from "001" to "999".
 Check 51: "D001R003" is the number  3 data file for the document
           and correctly uses "003".
```

```
"D001R004"
 Check 47: "D001R004" is eight characters long.
 Check 48: the first four characters of "D001R004" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R004" is the letter "R".
 Check 50: the last three characters of "D001R004" are "004",
           a decimal number from "001" to "999".
 Check 51: "D001R004" is the number  4 data file for the document
           and correctly uses "004".

"D001R005"
 Check 47: "D001R005" is eight characters long.
 Check 48: the first four characters of "D001R005" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R005" is the letter "R".
 Check 50: the last three characters of "D001R005" are "005",
           a decimal number from "001" to "999".
 Check 51: "D001R005" is the number  5 data file for the document
           and correctly uses "005".

"D001R006"
 Check 47: "D001R006" is eight characters long.
 Check 48: the first four characters of "D001R006" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R006" is the letter "R".
 Check 50: the last three characters of "D001R006" are "006",
           a decimal number from "001" to "999".
 Check 51: "D001R006" is the number  6 data file for the document
           and correctly uses "006".

"D001R007"
 Check 47: "D001R007" is eight characters long.
 Check 48: the first four characters of "D001R007" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R007" is the letter "R".
 Check 50: the last three characters of "D001R007" are "007",
           a decimal number from "001" to "999".
 Check 51: "D001R007" is the number  7 data file for the document
           and correctly uses "007".

"D001R008"
 Check 47: "D001R008" is eight characters long.
 Check 48: the first four characters of "D001R008" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R008" is the letter "R".
 Check 50: the last three characters of "D001R008" are "008",
           a decimal number from "001" to "999".
 Check 51: "D001R008" is the number  8 data file for the document
           and correctly uses "008".
```

```
"D001R009"
 Check 47: "D001R009" is eight characters long.
 Check 48: the first four characters of "D001R009" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R009" is the letter "R".
 Check 50: the last three characters of "D001R009" are "009",
           a decimal number from "001" to "999".
 Check 51: "D001R009" is the number  9 data file for the document
           and correctly uses "009".

"D001R010"
 Check 47: "D001R010" is eight characters long.
 Check 48: the first four characters of "D001R010" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R010" is the letter "R".
 Check 50: the last three characters of "D001R010" are "010",
           a decimal number from "001" to "999".
 Check 51: "D001R010" is the number 10 data file for the document
           and correctly uses "010".

"D001R011"
 Check 47: "D001R011" is eight characters long.
 Check 48: the first four characters of "D001R011" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R011" is the letter "R".
 Check 50: the last three characters of "D001R011" are "011",
           a decimal number from "001" to "999".
 Check 51: "D001R011" is the number 11 data file for the document
           and correctly uses "011".

"D001R012"
 Check 47: "D001R012" is eight characters long.
 Check 48: the first four characters of "D001R012" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R012" is the letter "R".
 Check 50: the last three characters of "D001R012" are "012",
           a decimal number from "001" to "999".
 Check 51: "D001R012" is the number 12 data file for the document
           and correctly uses "012".

"D001R013"
 Check 47: "D001R013" is eight characters long.
 Check 48: the first four characters of "D001R013" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R013" is the letter "R".
 Check 50: the last three characters of "D001R013" are "013",
           a decimal number from "001" to "999".
 Check 51: "D001R013" is the number 13 data file for the document
           and correctly uses "013".
```

```
"D001R014"
 Check 47: "D001R014" is eight characters long.
 Check 48: the first four characters of "D001R014" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R014" is the letter "R".
 Check 50: the last three characters of "D001R014" are "014",
           a decimal number from "001" to "999".
 Check 51: "D001R014" is the number 14 data file for the document
           and correctly uses "014".

"D001R015"
 Check 47: "D001R015" is eight characters long.
 Check 48: the first four characters of "D001R015" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R015" is the letter "R".
 Check 50: the last three characters of "D001R015" are "015",
           a decimal number from "001" to "999".
 Check 51: "D001R015" is the number 15 data file for the document
           and correctly uses "015".

"D001R016"
 Check 47: "D001R016" is eight characters long.
 Check 48: the first four characters of "D001R016" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R016" is the letter "R".
 Check 50: the last three characters of "D001R016" are "016",
           a decimal number from "001" to "999".
 Check 51: "D001R016" is the number 16 data file for the document
           and correctly uses "016".

"D001R017"
 Check 47: "D001R017" is eight characters long.
 Check 48: the first four characters of "D001R017" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R017" is the letter "R".
 Check 50: the last three characters of "D001R017" are "017",
           a decimal number from "001" to "999".
 Check 51: "D001R017" is the number 17 data file for the document
           and correctly uses "017".

"D001R018"
 Check 47: "D001R018" is eight characters long.
 Check 48: the first four characters of "D001R018" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R018" is the letter "R".
 Check 50: the last three characters of "D001R018" are "018",
           a decimal number from "001" to "999".
 Check 51: "D001R018" is the number 18 data file for the document
           and correctly uses "018".
```

```
"D001R019"
 Check 47: "D001R019" is eight characters long.
 Check 48: the first four characters of "D001R019" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R019" is the letter "R".
 Check 50: the last three characters of "D001R019" are "019",
           a decimal number from "001" to "999".
 Check 51: "D001R019" is the number 19 data file for the document
           and correctly uses "019".

"D001R020"
 Check 47: "D001R020" is eight characters long.
 Check 48: the first four characters of "D001R020" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R020" is the letter "R".
 Check 50: the last three characters of "D001R020" are "020",
           a decimal number from "001" to "999".
 Check 51: "D001R020" is the number 20 data file for the document
           and correctly uses "020".

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R001 -h

cals2aud Conversion Program Version 1.0

srcdocid: STAVL25732       38597                00010001UMF HN
            001A
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 002208,001728
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R001"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: STAVL25732       38597                00010001UMF HN
             001A"

 Check 56: the "srcdocid: " record is present.
 Check 57: "STAVL25732       38597                00010001UMF HN
            001A" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.
```

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002208,001728"

Check 72: the "rpelcnt: " record is present.
Check 73: "002208,001728" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************
```

Check 52: all the raster file records in "D001R001" are written with 128 byte ANSI type F fixed-length records.
Check 53: the header block is of length 2048 bytes.
Check 54: the second and all succeeding physical blocks of "D001R001" contain the image data encoded in raster CCITT group 4 code.
Check 55: all the data header records are written in the first physical block of "D001R001", with the block padded to the appropriate size.

```
------------------------------------------------------
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R002 -h

cals2aud Conversion Program Version 1.0

srcdocid: STAVL25732       38597                00010001UMF HN
            002A
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 002208,001728
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R002"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: STAVL25732       38597                00010001UMF HN
            002A"

 Check 56: the "srcdocid: " record is present.
 Check 57: "STAVL25732       38597                00010001UMF HN
            002A" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002208,001728"

Check 72: the "rpelcnt: " record is present.
Check 73: "002208,001728" follows the "rpelcnt: " record.

```
Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R002" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R002" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R002", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R003 -h

cals2aud Conversion Program Version 1.0

srcdocid: STAVL25732       38597              00010001UMF HN
           003A
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
```

```
rpelcnt: 002208,001728
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R003"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: STAVL25732       38597                 00010001UMF HN
            003A"

 Check 56: the "srcdocid: " record is present.
 Check 57: "STAVL25732       38597                 00010001UMF HN
            003A" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002208,001728"

Check 72: the "rpelcnt: " record is present.
Check 73: "002208,001728" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R003" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R003" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R003", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R004 -h

cals2aud Conversion Program Version 1.0

srcdocid:   A31U14667      98750 B              00010001UMB HN
            001E
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 006880,008800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
**************************************************
*                                                *
* Section 5.1.4.4 Data file header records.      *
*                                                *
**************************************************

Verifying the data file header records.

"D001R004"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   A31U14667      98750 B              00010001UMB HN
             001E"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  A31U14667      98750 B              00010001UMB HN
              001E" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.
```

```
Record 7. - Raster data type (rtype:).

"rtype: 1"

 Check 68: the "rtype: " record is present.
 Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

 Check 70: the "rorient: " record is present.
 Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 006880,008800"

 Check 72: the "rpelcnt: " record is present.
 Check 73: "006880,008800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R004" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R004" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R004", with the block
           padded to the appropriate size.
-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R005 -h

cals2aud Conversion Program Version 1.0

srcdocid:   B315000175     14804                 00010001UMF HN
            001D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R005"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   B315000175     14804                 00010001UMF HN
             001D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  B315000175     14804                 00010001UMF HN
              001D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

```
Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R005" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R005" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R005", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R006 -h

cals2aud Conversion Program Version 1.0

srcdocid:   B465-1         97896 E              00010001UMF HN
            001E
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
```

```
rpelcnt: 006912,009200
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R006"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   B465-1         97896 E              00010001UMF HN
             001E"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  B465-1         97896 E              00010001UMF HN
              001E" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.
```

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 006912,009200"

Check 72: the "rpelcnt: " record is present.
Check 73: "006912,009200" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ************************************************
    *                                              *
    * Section 5.2.1.6 Raster files                 *
    *                                              *
    ************************************************

Check 52: all the raster file records in "D001R006" are written
          with 128 byte ANSI type F fixed-length records.
Check 53: the header block is of length 2048 bytes.
Check 54: the second and all succeeding physical blocks of
          "D001R006" contain the image data encoded in raster
          CCITT group 4 code.
Check 55: all the data header records are written in the
          first physical block of "D001R006", with the block
          padded to the appropriate size.

-------------------------------------------------------

    ************************************************
    *                                              *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILE *
    *                                              *
    ************************************************

cals2aud D001R007 -h

cals2aud Conversion Program Version 1.0

srcdocid: SDB465-3         97896                00010001UMF HN
            001E
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 006912,009200
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R007"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: SDB465-3         97896                00010001UMF HN
            001E"

 Check 56: the "srcdocid: " record is present.
 Check 57: "SDB465-3         97896                00010001UMF HN
             001E" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.
```

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 006912,009200"

Check 72: the "rpelcnt: " record is present.
Check 73: "006912,009200" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************
```

Check 52: all the raster file records in "D001R007" are written with 128 byte ANSI type F fixed-length records.
Check 53: the header block is of length 2048 bytes.
Check 54: the second and all succeeding physical blocks of "D001R007" contain the image data encoded in raster CCITT group 4 code.
Check 55: all the data header records are written in the first physical block of "D001R007", with the block padded to the appropriate size.

```
------------------------------------------------------
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R008 -h

cals2aud Conversion Program Version 1.0

srcdocid:   C13469AV01     94580 A              00010001UMF HN
            001D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R008"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   C13469AV01     94580 A              00010001UMF HN
             001D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  C13469AV01     94580 A              00010001UMF HN
              001D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

```
Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R008" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R008" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R008", with the block
           padded to the appropriate size.

------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R009 -h

cals2aud Conversion Program Version 1.0

srcdocid:   C200100883     88818 J              00010001UMF HN
            001D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
```

```
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R009"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   C200100883     88818 J              00010001UMF HN
             001D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  C200100883     88818 J              00010001UMF HN
              001D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.
```

```
Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

 Check 68: the "rtype: " record is present.
 Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

 Check 70: the "rorient: " record is present.
 Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

 Check 72: the "rpelcnt: " record is present.
 Check 73: "004416,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R009" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R009" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R009", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ****************************************************
    *                                                  *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES  *
    *                                                  *
    ****************************************************

cals2aud D001R010 -h

cals2aud Conversion Program Version 1.0

srcdocid:   C999409901     88818 M              00010001UMF HN
            001D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R010"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   C999409901     88818 M              00010001UMF HN
             001D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  C999409901     88818 M              00010001UMF HN
              001D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.
```

```
Record 7. - Raster data type (rtype:).

"rtype: 1"

 Check 68: the "rtype: " record is present.
 Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

 Check 70: the "rorient: " record is present.
 Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

 Check 72: the "rpelcnt: " record is present.
 Check 73: "004416,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.
-------------------------------------------------------

    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R010" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R010" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R010", with the block
           padded to the appropriate size.
```

```
------------------------------------------------------
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R011 -h

cals2aud Conversion Program Version 1.0

srcdocid:   D-53319        77445 D              00010001UMF HN
            001D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R011"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   D-53319        77445 D              00010001UMF HN
             001D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  D-53319        77445 D              00010001UMF HN
              001D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

```
Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R011" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R011" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R011", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R012 -h

cals2aud Conversion Program Version 1.0

srcdocid:   D248-420-3A    57847 B              00010001UMF HN
            001D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
```

```
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R012"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   D248-420-3A    57847 B              00010001UMF HN
             001D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  D248-420-3A    57847 B              00010001UMF HN
              001D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

Check 52: all the raster file records in "D001R012" are written
          with 128 byte ANSI type F fixed-length records.
Check 53: the header block is of length 2048 bytes.
Check 54: the second and all succeeding physical blocks of
          "D001R012" contain the image data encoded in raster
          CCITT group 4 code.
Check 55: all the data header records are written in the
          first physical block of "D001R012", with the block
          padded to the appropriate size.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R013 -h

cals2aud Conversion Program Version 1.0

srcdocid:   E-2            13836                00010001UMF HN
            002D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R013"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   E-2            13836                00010001UMF HN
             002D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  E-2            13836                00010001UMF HN
              002D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.
```

```
Record 7. - Raster data type (rtype:).

"rtype: 1"

 Check 68: the "rtype: " record is present.
 Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

 Check 70: the "rorient: " record is present.
 Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

 Check 72: the "rpelcnt: " record is present.
 Check 73: "004416,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.
-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R013" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R013" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R013", with the block
           padded to the appropriate size.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R014 -h

cals2aud Conversion Program Version 1.0

srcdocid:   EA56512        36536 R              00010001UMF HN
            001C
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 003424,004400
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R014"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   EA56512        36536 R              00010001UMF HN
            001C"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  EA56512        36536 R              00010001UMF HN
             001C" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 003424,004400"

Check 72: the "rpelcnt: " record is present.
Check 73: "003424,004400" follows the "rpelcnt: " record.

```
Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R014" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R014" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R014", with the block
           padded to the appropriate size.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R015 -h

cals2aud Conversion Program Version 1.0

srcdocid:   EP2747-4359    99167 A              00010001KMF HN
            001E
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
```

```
rpelcnt: 006912,009200
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R015"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   EP2747-4359    99167 A              00010001KMF HN
             001E"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  EP2747-4359    99167 A              00010001KMF HN
              001E" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 006912,009200"

Check 72: the "rpelcnt: " record is present.
Check 73: "006912,009200" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R015" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R015" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R015", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R016 -h

cals2aud Conversion Program Version 1.0

srcdocid: SPES-10617       99974 A              00010001UMF HN
           003D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
**************************************************
*                                                *
* Section 5.1.4.4 Data file header records.      *
*                                                *
**************************************************
```

Verifying the data file header records.

"D001R016"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: SPES-10617 99974 A 00010001UMF HN
003D"

Check 56: the "srcdocid: " record is present.
Check 57: "SPES-10617 99974 A 00010001UMF HN
003D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

Check 58: the "dstdocid: " record is present.
Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************
```

Check 52: all the raster file records in "D001R016" are written with 128 byte ANSI type F fixed-length records.
Check 53: the header block is of length 2048 bytes.
Check 54: the second and all succeeding physical blocks of "D001R016" contain the image data encoded in raster CCITT group 4 code.
Check 55: all the data header records are written in the first physical block of "D001R016", with the block padded to the appropriate size.

```
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R017 -h

cals2aud Conversion Program Version 1.0

srcdocid: SPES-10617       99974 A              00010001UMF HN
            007D
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R017"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: SPES-10617       99974 A              00010001UMF HN
            007D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "SPES-10617       99974 A              00010001UMF HN
             007D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

Check 60: the "txtfilid: " record is present.
Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

Check 62: the "figid: " record is present.
Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

```
Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R017" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R017" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R017", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R018 -h

cals2aud Conversion Program Version 1.0


srcdocid: WDKEY-CHANGE-1   33333  EX098765 D    00010002U
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
```

```
rpelcnt: 001696,002218
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R018"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: WDKEY-CHANGE-1   33333  EX098765 D    00010002U"

 Check 56: the "srcdocid: " record is present.
 Check 57: "WDKEY-CHANGE-1   33333  EX098765 D    00010002U" follows the
"srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 001696,002218"

Check 72: the "rpelcnt: " record is present.
Check 73: "001696,002218" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R018" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R018" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R018", with the block
           padded to the appropriate size.

-------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER RECORDS  *
    *                                                    *
    ******************************************************

cals2aud D001R019 -h

cals2aud Conversion Program Version 1.0

srcdocid: WDKEY-CHANGE-1    33333  EX098765 D     00020002U
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 001696,002208
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

-------------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R019"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: WDKEY-CHANGE-1   33333  EX098765 D    00020002U"

 Check 56: the "srcdocid: " record is present.
 Check 57: "WDKEY-CHANGE-1   33333  EX098765 D    00020002U" follows the
"srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.
```

```
Record 7. - Raster data type (rtype:).

"rtype: 1"

 Check 68: the "rtype: " record is present.
 Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

 Check 70: the "rorient: " record is present.
 Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 001696,002208"

 Check 72: the "rpelcnt: " record is present.
 Check 73: "001696,002208" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

 Check 74: the "rdensty: " record is present.
 Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

 Check 76: the "notes: " record is present.
 Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:"
record.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R019" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R019" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R019", with the block
           padded to the appropriate size.
-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R020 -h

cals2aud Conversion Program Version 1.0

srcdocid: PLKEY-CHANGE-1   55555  AM567890 A    00010002U
dstdocid: 1840 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 001696,002211
rdensty: 0200
notes: Sample EDCARS to 1840 conversion image

cals2aud: normal completion

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R020"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid: PLKEY-CHANGE-1   55555  AM567890 A    00010002U"

 Check 56: the "srcdocid: " record is present.
 Check 57: "PLKEY-CHANGE-1   55555  AM567890 A    00010002U" follows the
"srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840 site" follows the "dstdocid: " record.
```

```
Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

 Check 66: the "doccls: " record is present.
 Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

 Check 68: the "rtype: " record is present.
 Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

 Check 70: the "rorient: " record is present.
 Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 001696,002211"

 Check 72: the "rpelcnt: " record is present.
 Check 73: "001696,002211" follows the "rpelcnt: " record.
```

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: Sample EDCARS to 1840 conversion image"

Check 76: the "notes: " record is present.
Check 77: " Sample EDCARS to 1840 conversion image" follows the "notes:" record.

```
**************************************************
*                                                *
* Section 5.2.1.6 Raster files                   *
*                                                *
**************************************************
```

Check 52: all the raster file records in "D001R020" are written with 128 byte ANSI type F fixed-length records.
Check 53: the header block is of length 2048 bytes.
Check 54: the second and all succeeding physical blocks of "D001R020" contain the image data encoded in raster CCITT group 4 code.
Check 55: all the data header records are written in the first physical block of "D001R020", with the block padded to the appropriate size.

Successful Completion of MIL-STD-1840A testing.*

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```
*****************************************************************
*                                                               *
*                  MIL-R-28002 VALIDATION                       *
*                                                               *
*  The raster files are tested for adherence to the             *
*  MIL-R-28002 standard as documented in                        *
*            MIL-R-28002, 20 December 1988                      *
*            Military Specification                             *
*            Raster Graphics Representation in Binary Format,   *
*                Requirements For                               *
*                                                               *
*                                                               *
*****************************************************************

RASTER FILE : "D001R001"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *              4 Encoding                            *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R001 D001R001.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 002208,001728"

 Check 5: the dimensions "002208,001728" are two positive numbers.
 Check 6: the actual image width is 2208.
 Check 7: the actual image height is 1728.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 2208, does not conform to recommended
values.
 Check 10: WARNING! the height, 1728, does not conform to recommended
values.


-------------------------------------------------------------


RASTER FILE : "D001R002"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R002 D001R002.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 002208,001728"

 Check 5: the dimensions "002208,001728" are two positive numbers.
 Check 6: the actual image width is 2208.
 Check 7: the actual image height is 1728.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 2208, does not conform to recommended
values.
 Check 10: WARNING! the height, 1728, does not conform to recommended
values.


------------------------------------------------------------------
```

```
RASTER FILE : "D001R003"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R003 D001R003.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 002208,001728"

 Check 5: the dimensions "002208,001728" are two positive numbers.
 Check 6: the actual image width is 2208.
 Check 7: the actual image height is 1728.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 2208, does not conform to recommended
values.
 Check 10: WARNING! the height, 1728, does not conform to recommended
values.

------------------------------------------------------------


RASTER FILE : "D001R004"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R004 D001R004.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 006880,008800"

 Check 5: the dimensions "006880,008800" are two positive numbers.
 Check 6: the actual image width is 6880.
 Check 7: the actual image height is 8800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 6880, does not conform to recommended
values.
 Check 10: the height, 8800, conforms to recommended E size values.


-------------------------------------------------------------


RASTER FILE : "D001R005"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R005 D001R005.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
     ******************************************************
     *                                                    *
     * Section 3.1.1 Raster data file header records      *
     *                                                    *
     ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R006"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R006 D001R006.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 006912,009200"

 Check 5: the dimensions "006912,009200" are two positive numbers.
 Check 6: the actual image width is 6912.
 Check 7: the actual image height is 9200.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 6912, does not conform to recommended
values.
 Check 10: WARNING! the height, 9200, does not conform to recommended
values.

------------------------------------------------------------


RASTER FILE : "D001R007"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R007 D001R007.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 006912,009200"

 Check 5: the dimensions "006912,009200" are two positive numbers.
 Check 6: the actual image width is 6912.
 Check 7: the actual image height is 9200.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 6912, does not conform to recommended
values.
 Check 10: WARNING! the height, 9200, does not conform to recommended
values.


-------------------------------------------------------------


RASTER FILE : "D001R008"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R008 D001R008.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R009"

    ****************************************************
    *                                                  *
    * Section 3.2 Verify CCITT Recommendation T.6 Group *
    *             4 Encoding                           *
    *                                                  *
    ****************************************************

Verifying data file content

cals2aud D001R009 D001R009.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------

    ****************************************************
    *                                                  *
    * Section 3.1.1 Raster data file header records    *
    *                                                  *
    ****************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


------------------------------------------------------------


RASTER FILE : "D001R010"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R010 D001R010.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


-------------------------------------------------------------


RASTER FILE : "D001R011"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R011 D001R011.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R012"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R012 D001R012.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


-------------------------------------------------------------


RASTER FILE : "D001R013"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R013 D001R013.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


-------------------------------------------------------------


RASTER FILE : "D001R014"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R014 D001R014.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 003424,004400"

 Check 5: the dimensions "003424,004400" are two positive numbers.
 Check 6: the actual image width is 3424.
 Check 7: the actual image height is 4400.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 3424, does not conform to recommended
values.
 Check 10: the height, 4400, conforms to recommended C size values.

------------------------------------------------------------
```

```
RASTER FILE : "D001R015"

    ****************************************************
    *                                                  *
    * Section 3.2 Verify CCITT Recommendation T.6 Group *
    *             4 Encoding                           *
    *                                                  *
    ****************************************************

Verifying data file content

cals2aud D001R015 D001R015.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------

    ****************************************************
    *                                                  *
    * Section 3.1.1 Raster data file header records    *
    *                                                  *
    ****************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 006912,009200"

 Check 5: the dimensions "006912,009200" are two positive numbers.
 Check 6: the actual image width is 6912.
 Check 7: the actual image height is 9200.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-----------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 6912, does not conform to recommended
values.
 Check 10: WARNING! the height, 9200, does not conform to recommended
values.


------------------------------------------------------------


RASTER FILE : "D001R016"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R016 D001R016.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


------------------------------------------------------------


RASTER FILE : "D001R017"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R017 D001R017.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R018"

     ******************************************************
     *                                                    *
     * Section 3.2 Verify CCITT Recommendation T.6 Group  *
     *             4 Encoding                             *
     *                                                    *
     ******************************************************

Verifying data file content

cals2aud D001R018 D001R018.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------

     ******************************************************
     *                                                    *
     * Section 3.1.1 Raster data file header records      *
     *                                                    *
     ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 001696,002218"

 Check 5: the dimensions "001696,002218" are two positive numbers.
 Check 6: the actual image width is 1696.
 Check 7: the actual image height is 2218.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-----------------------------------------------------------
```

```
     ******************************************************
     *                                                    *
     * Section 6.3.2 Scanlines for engineering drawings   *
     *                                                    *
     ******************************************************

 Check 9: WARNING! the width, 1696, does not conform to recommended
values.
 Check 10: WARNING! the height, 2218, does not conform to recommended
values.


------------------------------------------------------------


RASTER FILE : "D001R019"

     ******************************************************
     *                                                    *
     * Section 3.2 Verify CCITT Recommendation T.6 Group  *
     *             4 Encoding                             *
     *                                                    *
     ******************************************************

Verifying data file content

cals2aud D001R019 D001R019.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

     ******************************************************
     *                                                    *
     * Section 3.1.1 Raster data file header records      *
     *                                                    *
     ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 001696,002208"

 Check 5: the dimensions "001696,002208" are two positive numbers.
 Check 6: the actual image width is 1696.
 Check 7: the actual image height is 2208.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 1696, does not conform to recommended
values.
 Check 10: WARNING! the height, 2208, does not conform to recommended
values.


-------------------------------------------------------------


RASTER FILE : "D001R020"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R020 D001R020.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 001696,002211"

 Check 5: the dimensions "001696,002211" are two positive numbers.
 Check 6: the actual image width is 1696.
 Check 7: the actual image height is 2211.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 1696, does not conform to recommended
values.
 Check 10: WARNING! the height, 2211, does not conform to recommended
values.


------------------------------------------------------------



***Successful Completion of MIL-R-28002 testing.****
```

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ATTACHMENT 3 - IMAGE ANALYSIS

*SCALE (SCORE):
0 - 2 = Poor overall scan quality.
3 - 5 = Fair overall scan quality.
6 - 8 = Satisfactory overall scan quality.
9 = Good overall scan quality.
10 = Excellent overall scan quality.

FILE	SCORE*	NOTES
D001R001	6	Noticeable skew of one degree vertical and slight horizontal skew. All text legible. Some noise.
D001R002	6	Noticeable skew of one degree horizontally. Some illegible handwritten text. Most type text good. Some noise.
D001R003	9	All text legible. Negligible noise.
D001R004	9	Some extraneous bits around borders. All text legible. No noise.
D001R005	5	Slight horizontal skew. Moderate noise. Lots of illegible text.
D001R006	4	Very noisy, especially around text. Lots of illegible text. Thick black border around entire file.
D001R007	5	Noticeable skew of one degree horizontal, slight vertical skew. Some noise. Smudges around border corners. Unclear text or illegible text. Lines not complete.
D001R008	8	Generally clean, crisp quality but some text is thick and unreadable. Some noise.
D001R009	6	Noticeable skew of one degree horizontal. Side marks around border. Some illegible text.
D001R010	6	Some text bleeds together and some text is missing pieces. Lots of noise around text. Contains illegible handwriting. Black border around file.

D001R011	8	Most type text legible, but is light in contrast.
D001R012	8	Most lines are crisp, clean and continuous. Little noise. Some text illegible.
D001R013	7	Slight skew in horizontal and vertical direction. Clean around edges. Some text light in contrast.
D001R014	7	Incomplete lines around border. Some bleeding handwritten text.
D001R015	6	Slight vertical skew. Some text illegible or light in contrast. Noisy around border.
D001R016	9	Slight vertical skew. All observed lines continuous. Great text quality. Clear, clean hardly any noise.
D001R017	9	Clean, clear copy. Good text quality. Hardly any noise.
D001R018	7	Slight horizontal skew. Good text quality. Some noise.
D001R019	8	Text is of good quality. Some noise.
D001R020	8	Text is of good quality. Some noise.

PERCENTAGE DECREASE OF FILE SIZE AFTER SPECKLE REMOVAL

FILE	% drop
D001R001	7
D001R002	17
D001R003	1
D001R004	4
D001R005	16
D001R006	9
D001R007	5
D001R008	2
D001R009	4
D001R010	11
D001R011	3
D001R012	6
D001R013	3
D001R014	5
D001R015	14
D001R016	4
D001R017	4
D001R018	24
D001R019	24
D001R020	22

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```
*****************************************************************
*                                                               *
*                  MIL-STD-1840A VALIDATION                     *
*                                                               *
*  The program scans and validates the contents of a magnetic   *
*  tape for compliance to the MIL-STD-1840A standard.           *
*                                                               *
*                                                               *
*****************************************************************


    ******************************************************
    *                                                    *
    *   SCAN THE MIL-STD-1840A CALS TAPE                 *
    *                                                    *
    ******************************************************

rwmt -index

Volume label:
    Volume ID: "BKP009"    Owner ID: "EDCALS        "    Access: " "
 ------------------------------------------------------------
| File/Section | File ID  |  Cr Date | Acc | RF | RL  | BL   |
|--------------|----------|----------|-----|----|-----|------|
|   1    1     | D001     | 91/03/27 |     | D  | 256 | 2048 |
|   2    1     | D001R001 | 91/03/27 |     | F  | 128 | 2048 |
|   3    1     | D001R002 | 91/03/27 |     | F  | 128 | 2048 |
|   4    1     | D001R003 | 91/03/27 |     | F  | 128 | 2048 |
|   5    1     | D001R004 | 91/03/27 |     | F  | 128 | 2048 |
|   6    1     | D001R005 | 91/03/27 |     | F  | 128 | 2048 |
|   7    1     | D001R006 | 91/03/27 |     | F  | 128 | 2048 |
|   8    1     | D001R007 | 91/03/27 |     | F  | 128 | 2048 |
|   9    1     | D001R008 | 91/03/27 |     | F  | 128 | 2048 |
|  10    1     | D001R009 | 91/03/27 |     | F  | 128 | 2048 |
|  11    1     | D001R010 | 91/03/27 |     | F  | 128 | 2048 |
|  12    1     | D001R011 | 91/03/27 |     | F  | 128 | 2048 |
|  13    1     | D001R012 | 91/03/27 |     | F  | 128 | 2048 |
|  14    1     | D001R013 | 91/03/27 |     | F  | 128 | 2048 |
|  15    1     | D001R014 | 91/03/27 |     | F  | 128 | 2048 |
|  16    1     | D001R015 | 91/03/27 |     | F  | 128 | 2048 |
 ------------------------------------------------------------

-------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    *  VERIFY SECTION 5.2.1.1 Volume Identifier          *
    *                                                    *
    ******************************************************

Volume Identifier : "BKP009"
 Check 1: the tape volume identifier, "BKP009" is six characters.
 Check 2: the first character "B" is not a number.
 Check 3: the tape number, "09" starts at 09.
ERROR! the tape number, "09", must be "01" or space characters.
 Check 5: all characters in "BKP009" are limited to the ASCII
          numbers 0-9 and the upper-case letters.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *  VERIFY SECTION 5.1 File structure for transfer    *
    *                                                    *
    ******************************************************

 Check 6: There is one declaration file, "D001".
 Check 7: There exists at least one data file.
 Check 8: The declaration file, "D001", does precede the data files.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *            READ THE DECLARATION FILE               *
    *                                                    *
    ******************************************************

 rwmt -r -f 1 D001 -rf d
     15 records read from tape file #1 into "D001".

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DECLARATION FILE     *
    *                                                    *
    ******************************************************

catf D001

srcsys: West Coast Information Systems, Inc
srcdocid: To Be Assigned
srcrelid: NONE
chglvl: ORIGINAL, 15334840227
dteisu: 19910227
dstsys: UNKNOWN
dstdocid: To Be Assigned
```

```
dstrelid: NONE
dtetrn: 19910227
dlvacc: NONE
filcnt: R999
ttlcls: Unclassified
doccls: Unclassified
doctyp: Unclassified
docttl: EDCARS conversion to CALS group 4

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *  VERIFY SECTION 5.2.1.3 Declaration File           *
    *                                                    *
    ******************************************************

 Check 9:  the declaration file, "D001", consists of sequential
           variable length records.
 Check 10: the records are all of ANSI type D (variable).
 Check 11: the maximum record length is 256 bytes.
 Check 12: each block is 2048 bytes.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.1.1 Declaration File Name              *
    *                                                    *
    ******************************************************

Verifying Declaration File Name, "D001"

 Check 13: "D001" is four characters in length.
 Check 14: the first character of "D001" is a "D".
 Check 15: the next three characters in "D001" are ASCII
           numbers between 001 to 999.


-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.1.2 Declaration File Content         *
    *                                                  *
    ****************************************************

Verifying the Contents of the Declaration File, "D001"

Record 1. - Source system (srcsys:).

"srcsys: West Coast Information Systems, Inc"

 Check 16: the "srcsys: " record is present.
 Check 17: "West Coast Information Systems, Inc" follows the "srcsys: "
record.

Record 2. - Source system document identifier (srcdocid:).

"srcdocid: To Be Assigned"

 Check 18: the "srcdocid: " record is present.
 Check 19: "To Be Assigned" follows the "srcdocid: " record.

Record 3. - Source system related document identifier (srcrelid:).

"srcrelid: NONE"

 Check 20: the "srcrelid: " record is present.
 Check 21: "NONE" follows the "srcrelid: " record.

Record 4. - Highest revision and change level in the document
            (chglvl:).

"chglvl: ORIGINAL, 15334840227"

 Check 22: the "chglvl: " record is present.
ERROR! date must be in YYYYMMDD format.
Record 5. - Date of issue of the latest change to the document
            (dteisu:).

"dteisu: 19910227"

 Check 24: the "dteisu: " record is present.
 Check 25: the date, 19910227, is provided in YYYYMMDD format.

Record 6. - Destination system (dstsys:).

"dstsys: UNKNOWN"

 Check 26: the "dstsys: " record is present.
 Check 27: "UNKNOWN" follows the "dstsys: " record.
```

Record 7. - Destination system document identifier (dstdocid:).

"dstdocid: To Be Assigned"

Check 28: the "dstdocid: " record is present.
Check 29: "To Be Assigned" follows the "dstdocid: " record.

Record 8. - Destination system related document identifier (dstrelid:).

"dstrelid: NONE"

Check 30: the "dstrelid: " record is present.
Check 31: "NONE" follows the "dstrelid: " record.

Record 9. - Date of transfer (dtetrn:).

"dtetrn: 19910227"

Check 32: the "dtetrn: " record is present.
Check 33: the date, 19910227, is provided in YYYYMMDD format.

Record 10. - Delivery accounting (dlvacc:).

"dlvacc: NONE"

Check 34: the "dlvacc: " record is present.
Check 35: "NONE" follows the "dlvacc: " record.

Record 11. - File count (filcnt:).

"filcnt: R999"

Check 36: the "filcnt: " record is present.
Check 37: the letter "R" immediately follows the record.
Check 38: the file count, 999, follows the "R" with no spaces between the count and the character.

ERROR! count of data files do not match actual count.
Record 12. - Title Security Label (ttlcls:).

"ttlcls: Unclassified"

Check 39: the "ttlcls: " record is present.
Check 40: "Unclassified" follows the "ttlcls: " record.

Record 13. - Document Security Label (doccls:).

"doccls: Unclassified"

Check 41: the "doccls: " record is present.
Check 42: "Unclassified" follows the "doccls: " record.

Record 14. - Document Type (doctyp:).

"doctyp: Unclassified"

Check 43: the "doctyp: " record is present.
Check 44: "Unclassified" follows the "doctyp: " record.

Record 15. - Document Title (docttl:).

"docttl: EDCARS conversion to CALS group 4"

Check 45: the "docttl: " record is present.
Check 46: "EDCARS conversion to CALS group 4" follows the "docttl: " record.

```
    ******************************************************
    *                                                    *
    * Section 5.1.3  Data File Name                      *
    *                                                    *
    ******************************************************
```

Verifying the Names of the 15 data files

"D001R001"
Check 47: "D001R001" is eight characters long.
Check 48: the first four characters of "D001R001" are the same as the declaration file name, "D001".
Check 49: the fifth character of "D001R001" is the letter "R".
Check 50: the last three characters of "D001R001" are "001", a decimal number from "001" to "999".
Check 51: "D001R001" is the number 1 data file for the document and correctly uses "001".

"D001R002"
Check 47: "D001R002" is eight characters long.
Check 48: the first four characters of "D001R002" are the same as the declaration file name, "D001".
Check 49: the fifth character of "D001R002" is the letter "R".
Check 50: the last three characters of "D001R002" are "002", a decimal number from "001" to "999".
Check 51: "D001R002" is the number 2 data file for the document and correctly uses "002".

```
"D001R003"
 Check 47: "D001R003" is eight characters long.
 Check 48: the first four characters of "D001R003" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R003" is the letter "R".
 Check 50: the last three characters of "D001R003" are "003",
           a decimal number from "001" to "999".
 Check 51: "D001R003" is the number  3 data file for the document
           and correctly uses "003".

"D001R004"
 Check 47: "D001R004" is eight characters long.
 Check 48: the first four characters of "D001R004" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R004" is the letter "R".
 Check 50: the last three characters of "D001R004" are "004",
           a decimal number from "001" to "999".
 Check 51: "D001R004" is the number  4 data file for the document
           and correctly uses "004".

"D001R005"
 Check 47: "D001R005" is eight characters long.
 Check 48: the first four characters of "D001R005" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R005" is the letter "R".
 Check 50: the last three characters of "D001R005" are "005",
           a decimal number from "001" to "999".
 Check 51: "D001R005" is the number  5 data file for the document
           and correctly uses "005".

"D001R006"
 Check 47: "D001R006" is eight characters long.
 Check 48: the first four characters of "D001R006" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R006" is the letter "R".
 Check 50: the last three characters of "D001R006" are "006",
           a decimal number from "001" to "999".
 Check 51: "D001R006" is the number  6 data file for the document
           and correctly uses "006".

"D001R007"
 Check 47: "D001R007" is eight characters long.
 Check 48: the first four characters of "D001R007" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R007" is the letter "R".
 Check 50: the last three characters of "D001R007" are "007",
           a decimal number from "001" to "999".
 Check 51: "D001R007" is the number  7 data file for the document
           and correctly uses "007".
```

```
"D001R008"
 Check 47: "D001R008" is eight characters long.
 Check 48: the first four characters of "D001R008" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R008" is the letter "R".
 Check 50: the last three characters of "D001R008" are "008",
           a decimal number from "001" to "999".
 Check 51: "D001R008" is the number  8 data file for the document
           and correctly uses "008".

"D001R009"
 Check 47: "D001R009" is eight characters long.
 Check 48: the first four characters of "D001R009" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R009" is the letter "R".
 Check 50: the last three characters of "D001R009" are "009",
           a decimal number from "001" to "999".
 Check 51: "D001R009" is the number  9 data file for the document
           and correctly uses "009".

"D001R010"
 Check 47: "D001R010" is eight characters long.
 Check 48: the first four characters of "D001R010" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R010" is the letter "R".
 Check 50: the last three characters of "D001R010" are "010",
           a decimal number from "001" to "999".
 Check 51: "D001R010" is the number 10 data file for the document
           and correctly uses "010".

"D001R011"
 Check 47: "D001R011" is eight characters long.
 Check 48: the first four characters of "D001R011" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R011" is the letter "R".
 Check 50: the last three characters of "D001R011" are "011",
           a decimal number from "001" to "999".
 Check 51: "D001R011" is the number 11 data file for the document
           and correctly uses "011".

"D001R012"
 Check 47: "D001R012" is eight characters long.
 Check 48: the first four characters of "D001R012" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R012" is the letter "R".
 Check 50: the last three characters of "D001R012" are "012",
           a decimal number from "001" to "999".
 Check 51: "D001R012" is the number 12 data file for the document
           and correctly uses "012".
```

```
"D001R013"
 Check 47: "D001R013" is eight characters long.
 Check 48: the first four characters of "D001R013" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R013" is the letter "R".
 Check 50: the last three characters of "D001R013" are "013",
           a decimal number from "001" to "999".
 Check 51: "D001R013" is the number 13 data file for the document
           and correctly uses "013".

"D001R014"
 Check 47: "D001R014" is eight characters long.
 Check 48: the first four characters of "D001R014" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R014" is the letter "R".
 Check 50: the last three characters of "D001R014" are "014",
           a decimal number from "001" to "999".
 Check 51: "D001R014" is the number 14 data file for the document
           and correctly uses "014".

"D001R015"
 Check 47: "D001R015" is eight characters long.
 Check 48: the first four characters of "D001R015" are the same as
           the declaration file name, "D001".
 Check 49: the fifth character of "D001R015" is the letter "R".
 Check 50: the last three characters of "D001R015" are "015",
           a decimal number from "001" to "999".
 Check 51: "D001R015" is the number 15 data file for the document
           and correctly uses "015".


-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R001 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST01      82918                00010001UMF HN
            001A
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 001728,002200
```

```
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R001"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST01      82918                00010001UMF HN
             001A"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST01      82918                00010001UMF HN
              001A" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.
```

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

Check 64: the "srcgph: " record is present.
Check 65: "NONE" follows the "srcgph: " record.

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 001728,002200"

Check 72: the "rpelcnt: " record is present.
Check 73: "001728,002200" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R001" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R001" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R001", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ****************************************************
    *                                                  *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES  *
    *                                                  *
    ****************************************************

cals2aud D001R002 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST02      82918                00010001UMF HN
            002B
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 002240,003400
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R002"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST02      82918                00010001UMF HN
             002B"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST02      82918                00010001UMF HN
              002B" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002240,003400"

Check 72: the "rpelcnt: " record is present.
Check 73: "002240,003400" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R002" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R002" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R002", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ****************************************************
    *                                                  *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES  *
    *                                                  *
    ****************************************************

cals2aud D001R003 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST03      82918                00010001UMF HN
            003C
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 003456,004400
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R003"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST03      82918               00010001UMF HN
             003C"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST03      82918               00010001UMF HN
              003C" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 003456,004400"

Check 72: the "rpelcnt: " record is present.
Check 73: "003456,004400" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R003" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R003" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R003", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R004 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST04      82918                00010001UMF HN
            004D
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004416,006800
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R004"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST04      82918                00010001UMF HN
             004D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST04      82918                00010001UMF HN
              004D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004416,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004416,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R004" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R004" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R004", with the block
           padded to the appropriate size.

-------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R005 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST05      82918                00010001UMF HN
            005E
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 006848,008800
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R005"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST05      82918                 00010001UMF HN
             005E"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST05      82918                 00010001UMF HN
              005E" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 006848,008800"

Check 72: the "rpelcnt: " record is present.
Check 73: "006848,008800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R005" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R005" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R005", with the block
           padded to the appropriate size.

-------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R006 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST06      82918                 00010001UMF HN
            006A
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 000128,000128
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R006"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST06      82918                 00010001UMF HN
             006A"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST06      82918                 00010001UMF HN
              006A" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 000128,000128"

Check 72: the "rpelcnt: " record is present.
Check 73: "000128,000128" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R006" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R006" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R006", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R007 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST07      82918                00010001UMF HN
            007C
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 003600,000056
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R007"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST07      82918                00010001UMF HN
             007C"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST07      82918                00010001UMF HN
              007C" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 003600,000056"

Check 72: the "rpelcnt: " record is present.
Check 73: "003600,000056" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R007" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R007" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R007", with the block
           padded to the appropriate size.

-----------------------------------------------------------

    ****************************************************
    *                                                  *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES  *
    *                                                  *
    ****************************************************

cals2aud D001R008 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST08      82918               00010001UMF HN
            008C
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 003600,000056
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-----------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R008"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST08      82918                00010001UMF HN
             008C"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST08      82918                00010001UMF HN
              008C" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 003600,000056"

Check 72: the "rpelcnt: " record is present.
Check 73: "003600,000056" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R008" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R008" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R008", with the block
           padded to the appropriate size.

-------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R009 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST09      82918                00010001UMF HN
            009B
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 002480,003616
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R009"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST09      82918                 00010001UMF HN
             009B"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST09      82918                 00010001UMF HN
              009B" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002480,003616"

Check 72: the "rpelcnt: " record is present.
Check 73: "002480,003616" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R009" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R009" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R009", with the block
           padded to the appropriate size.

-----------------------------------------------------------

    ****************************************************
    *                                                  *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES  *
    *                                                  *
    ****************************************************

cals2aud D001R010 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST10      82918                00010001UMF HN
            010E
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 006800,008800
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-----------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R010"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST10      82918                 00010001UMF HN
             010E"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST10      82918                 00010001UMF HN
              010E" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 006800,008800"

Check 72: the "rpelcnt: " record is present.
Check 73: "006800,008800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R010" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R010" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R010", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R011 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST11      82918              00010001UMF HN
            011B
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 002208,003312
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R011"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST11      82918                00010001UMF HN
             011B"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST11      82918                00010001UMF HN
              011B" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002208,003312"

Check 72: the "rpelcnt: " record is present.
Check 73: "002208,003312" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R011" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R011" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R011", with the block
           padded to the appropriate size.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R012 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST12      82918                00010001UMF HN
            012D
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004848,006800
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 5.1.4.4 Data file header records.          *
    *                                                    *
    ******************************************************

Verifying the data file header records.

"D001R012"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST12      82918                 00010001UMF HN
             012D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST12      82918                 00010001UMF HN
              012D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004848,006800"

Check 72: the "rpelcnt: " record is present.
Check 73: "004848,006800" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R012" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R012" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R012", with the block
           padded to the appropriate size.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R013 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST13      82918                00010001UMF HN
            013A
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 002208,001656
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

------------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R013"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST13      82918                00010001UMF HN
             013A"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST13      82918                00010001UMF HN
              013A" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 002208,001656"

Check 72: the "rpelcnt: " record is present.
Check 73: "002208,001656" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R013" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R013" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R013", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R014 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST14      82918                00010001UMF HN
            014D
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 004688,006624
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R014"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST14      82918                00010001UMF HN
             014D"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST14      82918                00010001UMF HN
              014D" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 004688,006624"

Check 72: the "rpelcnt: " record is present.
Check 73: "004688,006624" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ******************************************************
    *                                                    *
    * Section 5.2.1.6 Raster files                       *
    *                                                    *
    ******************************************************

 Check 52: all the raster file records in "D001R014" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R014" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R014", with the block
           padded to the appropriate size.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    *     PRINT THE CONTENTS OF THE DATA HEADER FILES    *
    *                                                    *
    ******************************************************

cals2aud D001R015 -h

cals2aud Conversion Program Version 1.0


srcdocid:   CTNTEST15      82918                00010001UMF HN
            015C
dstdocid: 1840A group 4 site
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: NONE
rtype: 1
rorient: 090,270
rpelcnt: 003312,004680
rdensty: 0200
notes: EDCARS to 1840 group 4 conversion image

cals2aud: normal completion

-------------------------------------------------------
```

```
    ****************************************************
    *                                                  *
    * Section 5.1.4.4 Data file header records.        *
    *                                                  *
    ****************************************************

Verifying the data file header records.

"D001R015"

Record 1. - Source system document identifier (srcdocid:).

"srcdocid:   CTNTEST15      82918                00010001UMF HN
             015C"

 Check 56: the "srcdocid: " record is present.
 Check 57: "  CTNTEST15      82918                00010001UMF HN
              015C" follows the "srcdocid: " record.

Record 2. - Destination system document identifier (dstdocid:).

"dstdocid: 1840A group 4 site"

 Check 58: the "dstdocid: " record is present.
 Check 59: "1840A group 4 site" follows the "dstdocid: " record.

Record 3. - Text file identifier (txtfilid:).

"txtfilid: NONE"

 Check 60: the "txtfilid: " record is present.
 Check 61: "NONE" follows the "txtfilid: " record.

Record 4. - Figure identifier (figid:).

"figid: NONE"

 Check 62: the "figid: " record is present.
 Check 63: "NONE" follows the "figid: " record.

Record 5. - Source system graphics filename (srcgph:).

"srcgph: NONE"

 Check 64: the "srcgph: " record is present.
 Check 65: "NONE" follows the "srcgph: " record.
```

Record 6. - Data file security label (doccls:).

"doccls: NONE"

Check 66: the "doccls: " record is present.
Check 67: "NONE" follows the "doccls: " record.

Record 7. - Raster data type (rtype:).

"rtype: 1"

Check 68: the "rtype: " record is present.
Check 69: "1" follows the "rtype: " record.

Record 8. - Raster image orientation (rorient:).

"rorient: 090,270"

Check 70: the "rorient: " record is present.
Check 71: "090,270" follows the "rorient: " record.

Record 9. - Raster image pel count (rpelcnt:).

"rpelcnt: 003312,004680"

Check 72: the "rpelcnt: " record is present.
Check 73: "003312,004680" follows the "rpelcnt: " record.

Record 10. - Raster image density (rdensty:).

"rdensty: 0200"

Check 74: the "rdensty: " record is present.
Check 75: "0200" follows the "rdensty: " record.

Record 11. - Notes (notes:).

"notes: EDCARS to 1840 group 4 conversion image"

Check 76: the "notes: " record is present.
Check 77: " EDCARS to 1840 group 4 conversion image" follows the "notes:" record.

```
    ****************************************************
    *                                                  *
    * Section 5.2.1.6 Raster files                     *
    *                                                  *
    ****************************************************

 Check 52: all the raster file records in "D001R015" are written
           with 128 byte ANSI type F fixed-length records.
 Check 53: the header block is of length 2048 bytes.
 Check 54: the second and all succeeding physical blocks of
           "D001R015" contain the image data encoded in raster
           CCITT group 4 code.
 Check 55: all the data header records are written in the
           first physical block of "D001R015", with the block
           padded to the appropriate size.


***Successful  Completion  of  MIL-STD-1840A  testing.****
```

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```
*****************************************************************
*                                                               *
*                  MIL-R-28002 VALIDATION                       *
*                                                               *
*  The raster files are tested for adherence to the             *
*  MIL-R-28002 standard as documented in                        *
*            MIL-R-28002, 20 December 1988                      *
*            Military Specification                             *
*            Raster Graphics Representation in Binary Format,   *
*                Requirements For                               *
*                                                               *
*                                                               *
*****************************************************************

RASTER FILE : "D001R001"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R001 D001R001.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 001728,002200"

 Check 5: the dimensions "001728,002200" are two positive numbers.
 Check 6: the actual image width is 1728.
 Check 7: the actual image height is 2200.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 1728, conforms to recommended A size values.
 Check 10: the height, 2200, conforms to recommended A size values.


-------------------------------------------------------------


RASTER FILE : "D001R002"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R002 D001R002.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************
```

"rtype: 1"

Check 2: data is of type I.

"rorient: 090,270"

Check 3: the pel path "090" is a permissible value.
Check 4: the line progression "270" is a permissible value.

"rpelcnt: 002240,003400"

Check 5: the dimensions "002240,003400" are two positive numbers.
Check 6: the actual image width is 2240.
Check 7: the actual image height is 3400.

"rdensity: 0200"

Check 8: the raster image density is 200.

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************
```

Check 9: the width, 2240, conforms to recommended B,G size values.
Check 10: the height, 3400, conforms to recommended B size values.

```
RASTER FILE : "D001R003"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R003 D001R003.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 003456,004400"

 Check 5: the dimensions "003456,004400" are two positive numbers.
 Check 6: the actual image width is 3456.
 Check 7: the actual image height is 4400.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

Check 9: the width, 3456, conforms to recommended C size values.
Check 10: the height, 4400, conforms to recommended C size values.


------------------------------------------------------------


RASTER FILE : "D001R004"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R004 D001R004.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 004416,006800"

 Check 5: the dimensions "004416,006800" are two positive numbers.
 Check 6: the actual image width is 4416.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 4416, conforms to recommended D size values.
 Check 10: the height, 6800, conforms to recommended D size values.


-------------------------------------------------------------


RASTER FILE : "D001R005"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R005 D001R005.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 006848,008800"

 Check 5: the dimensions "006848,008800" are two positive numbers.
 Check 6: the actual image width is 6848.
 Check 7: the actual image height is 8800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: the width, 6848, conforms to recommended E,J size values.
 Check 10: the height, 8800, conforms to recommended E size values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R006"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R006 D001R006.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 000128,000128"

 Check 5: the dimensions "000128,000128" are two positive numbers.
 Check 6: the actual image width is 128.
 Check 7: the actual image height is 128.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 128, does not conform to recommended
values.
 Check 10: WARNING! the height, 128, does not conform to recommended
values.


------------------------------------------------------------


RASTER FILE : "D001R007"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R007 D001R007.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 003600,000056"

 Check 5: the dimensions "003600,000056" are two positive numbers.
 Check 6: the actual image width is 3600.
 Check 7: the actual image height is 56.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 3600, does not conform to recommended
values.
 Check 10: WARNING! the height, 56, does not conform to recommended
values.


-------------------------------------------------------------


RASTER FILE : "D001R008"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R008 D001R008.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 003600,000056"

 Check 5: the dimensions "003600,000056" are two positive numbers.
 Check 6: the actual image width is 3600.
 Check 7: the actual image height is 56.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 3600, does not conform to recommended
values.
 Check 10: WARNING! the height, 56, does not conform to recommended
values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R009"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R009 D001R009.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 002480,003616"

 Check 5: the dimensions "002480,003616" are two positive numbers.
 Check 6: the actual image width is 2480.
 Check 7: the actual image height is 3616.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 2480, does not conform to recommended
values.
 Check 10: WARNING! the height, 3616, does not conform to recommended
values.

------------------------------------------------------------


RASTER FILE : "D001R010"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R010 D001R010.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 006800,008800"

 Check 5: the dimensions "006800,008800" are two positive numbers.
 Check 6: the actual image width is 6800.
 Check 7: the actual image height is 8800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 6800, does not conform to recommended
values.
 Check 10: the height, 8800, conforms to recommended E size values.


-------------------------------------------------------------


RASTER FILE : "D001R011"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R011 D001R011.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 002208,003312"

 Check 5: the dimensions "002208,003312" are two positive numbers.
 Check 6: the actual image width is 2208.
 Check 7: the actual image height is 3312.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 2208, does not conform to recommended
values.
 Check 10: the height, 3312, conforms to recommended A3 size values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R012"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R012 D001R012.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-----------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004848,006800"

 Check 5: the dimensions "004848,006800" are two positive numbers.
 Check 6: the actual image width is 4848.
 Check 7: the actual image height is 6800.

"rdensity: 0200"

 Check 8: the raster image density is 200.

-----------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 4848, does not conform to recommended
values.
 Check 10: the height, 6800, conforms to recommended D size values.


-------------------------------------------------------------


RASTER FILE : "D001R013"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R013 D001R013.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

-------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.
```

```
"rpelcnt: 002208,001656"

 Check 5: the dimensions "002208,001656" are two positive numbers.
 Check 6: the actual image width is 2208.
 Check 7: the actual image height is 1656.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 2208, does not conform to recommended
values.
 Check 10: WARNING! the height, 1656, does not conform to recommended
values.


------------------------------------------------------------


RASTER FILE : "D001R014"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4 Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R014 D001R014.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------
```

```
    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 004688,006624"

 Check 5: the dimensions "004688,006624" are two positive numbers.
 Check 6: the actual image width is 4688.
 Check 7: the actual image height is 6624.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 6.3.2 Scanlines for engineering drawings   *
    *                                                    *
    ******************************************************

 Check 9: WARNING! the width, 4688, does not conform to recommended
values.
 Check 10: WARNING! the height, 6624, does not conform to recommended
values.


------------------------------------------------------------
```

```
RASTER FILE : "D001R015"

    ******************************************************
    *                                                    *
    * Section 3.2 Verify CCITT Recommendation T.6 Group  *
    *             4.Encoding                             *
    *                                                    *
    ******************************************************

Verifying data file content

cals2aud D001R015 D001R015.PIC

cals2aud Conversion Program Version 1.0

cals2aud: normal completion

 Check 1: compressed data conforms to CCITT Group IV
          recommendations.

------------------------------------------------------------

    ******************************************************
    *                                                    *
    * Section 3.1.1 Raster data file header records      *
    *                                                    *
    ******************************************************

"rtype: 1"

 Check 2: data is of type I.

"rorient: 090,270"

 Check 3: the pel path "090" is a permissible value.
 Check 4: the line progression "270" is a permissible value.

"rpelcnt: 003312,004680"

 Check 5: the dimensions "003312,004680" are two positive numbers.
 Check 6: the actual image width is 3312.
 Check 7: the actual image height is 4680.

"rdensity: 0200"

 Check 8: the raster image density is 200.

------------------------------------------------------------
```

```
*****************************************************
*                                                   *
* Section 6.3.2 Scanlines for engineering drawings  *
*                                                   *
*****************************************************
```

Check 9: the width, 3312, conforms to recommended A2 size values.
Check 10: the height, 4680, conforms to recommended A2 size values.

Successful Completion of MIL-R-28002 testing.*

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ATTACHMENT 3 - IMAGE ANALYSIS

*SCALE (SCORE): 0 - 2 = Poor overall scan quality.
3 - 5 = Fair overall scan quality.
6 - 8 = Satisfactory overall scan quality.
9 = Good overall scan quality.
10 = Excellent overall scan quality.

FILE	SCORE*	NOTES
D001R001	8	Slight horizontal skew. All text legible. Some noise. Good line continuity.
D001R002	7	Some illegible type text. Very noisy.
D001R003	8	All text legible. Moderate noise. Good line continuity.
D001R004	7	Illegible and unclear text. Moderate noise.
D001R005	7	Illegible and unclear text. Very noisy.
D001R006	10	Very clean. Excellent line continuity. Unknown orientation.
D001R007	8	Extremely noisy. Excellent line continuity.
D001R008	9	Some noise. Excellent line continuity.
D001R009	10	Exceptional.
D001R010	10	Exceptional.
D001R011	10	Exceptional.
D001R012	10	Exceptional.
D001R013	9	Check orientation, exceptional otherwise.
D001R014	10	Exceptional.
D001R015	10	Exceptional.

PERCENTAGE DECREASE OF FILE SIZE AFTER SPECKLE REMOVAL

FILE	% drop
D001R001	4
D001R002	12
D001R003	10
D001R004	10
D001R005	10
D001R006	0
D001R007	33
D001R008	0
D001R009	0
D001R010	0
D001R011	2
D001R012	0
D001R013	2
D001R014	2
D001R015	2

APPENDIX B EDCARS Test Script

DSREDS/EDCARS/EDMICS TEST TEAM (DEETT) PERSPECTIVE
EDCARS LABORATORY ACCEPTANCE TEST

Predicated on the Pre-test discussions with the EDCARS PM and representatives of the contractors, it is the understanding of the CTN that the EDCARS system is an existing digital data system with the following capabilities:

1. Raster image scan/capture capability.
2. Raster image compression capability.
3. Raster image QA display/edit capability.
4. Image database/storage capability.
5. Image database/retrieval capability.
6. EDCARS format raster image interchange capability.

The previously stated functions are in place and operational and not intended for re-certification.

Modification of the EDCARS system has been undertaken to provide a CALS data format import/export option. The data interchange strategy is to translate CALS data into EDCARS format, entering the system, and to translate EDCARS data into the CALS format upon leaving the system. CTN testing is intended to:

1. Evaluate the newly implemented capabilities, determine if the targeted functionality is "CALS ready."

2. Assist the EDCARS PM (if requested) to evaluate the impact on the existing EDCARS system (to the extent resources allow).

Recent changes in EDCARS PM and the scheduling of this test have precluded any interaction between the new EDCARS PM and the CTN DEETT. At this time it is the understanding of the CTN (as a carry over from the previous EDCARS PM) that the existing EDCARS functionality is unaffected by the upgrade and does not require re-certification.

The CTN assumes no additional requirements by the EDCARS PM and that the process as outlined in the "EDCARS CALS Conversion Laboratory Acceptance Draft Test Plan", 19 November 1990 (in accordance with the generic CTN "Test Plan MIL-STD-1840A Testing to Support DSREDS, EDCARS, and EDMICS Compliance with CALS standards, 24 December 1990) shall provide general guidance for the test procedures.

NOTE:

As a point of reference, the DSREDS PM did not request CTN participation in systems revalidation testing; however, he did require that the CTN Raster Test Suite data, loop through the complete DSREDS process. The DSREDS test script was used as a guide in developing the EDCARS test, it is presented here as reference material.

The CTN test script shall:

1. Read test suite into the systems.
2. Convert test data to DSREDS data format.
3. Present test data for QA.
4. Annotate each test file to indicate DSREDS acceptance.
5. Release test data for storage on the optical media.
6. Retrieve test data from the optical media.

7. Retrieve 1 each "A" to "J" DSREDS native unclassified images from optical disk.
8. Present retrieved data for viewing.
9. Queue retrieved data for export interchange.
10. Convert retrieved data to CALS format.
11. Write two copies of the retrieved data to CALS media.
12. Mail media to the CTN for evaluation.
13. Mail media to AUDRE, Inc. for independent evaluation.

In the process of handling the data the following issues will be addressed:

1. The system is able to read MIL-STD-1840A tapes.
2. The system can detect erroneous Group-4 encoding.
3. The system is able to generate valid Group-4 encoding.
4. The system is able to write MIL-STD-1840A tapes.

The CTN representative will provide:

1. A MIL-STD-1840A tape containing the Raster Reference Data.
2. A two volume MIL-STD-1840A tape set containing miscellaneous CALS files.
3. Audit the returned test tape for:
   a. MIL-STD-1840A packaging
   b. MIL-STD-1840A format issues
   c. ANSI X3.27 format issues
   d. MIL-R-28002 issues (returned test suite)
   e. CCITT T.6 encoding

AUDRE Inc. will provide:

1. Audit and comment on the data interchange procedure.
2. Audit the returned test tape for:
   a. MIL-STD-1840A packaging
   b. MIL-STD-1840A format issues
   c. ANSI X3.27 format issues
   d. MIL-R-28002 issues (native DSREDS data)
   e. CCITT T.6 encoding

DSREDS contractors will provide:

1. (2) MIL-STD-1840A tapes both containing:
   a. annotated test suite files D001R001 to D001R018
   b. native DSREDS files, 1 each "A" to "J" size
2. shipment of tapes to the test facilities.
   a. Package tapes individually as per MIL-STD-1840A
   b. Ship one to CTNO/LLNL
      Lawrence Livermore National Laboratory
      Att. Nick Mitschkowetz
      Mail Stop L-542
      7000 East Avenue
      Livermore, CA 94550
   c. Ship one to AUDRE, Inc.
      AUDRE, Inc.
      Att: Melody DeJong
      10915 Technology Place
      San Diego, CA 92127

DSREDS/EDCARS TESTING CONTINUATION
EDCARS USER APPLICATION TESTING
McClellan AFB, Sacramento, CA

The intent of the User Application Test is to conduct tests, at a field site, to demonstrate the user application of the modified EDCARS system (CTN Test Plan 24 December 1990). As opposed to the previous EDCARS Development Level Test (Bench Test), no contractor developed acceptance test has been presented to the CTNO DSREDS/EDCARS/EDMICS Test Team (DEETT).

It is the understanding of the DEETT that the predications stipulated for the EDCARS Bench LAT also apply to the UAT.

The EDCARS system is an existing digital data system with the following capabilities:

1. Raster image scan/capture capability.
2. Raster image compression capability.
3. Raster image QA display/edit capability
4. Image database/storage capability.
5. Image database/retrieval capability.
6. EDCARS format raster image interchange capability.

The previously stated functions are in place and operational and not intended for re-certification.

Modification of the EDCARS system has been undertaken to provide a CALS data format import/export option. The data interchange strategy is to translate CALS data into EDCARS format, entering the system, and to translate EDCARS data into the CALS format upon leaving the system. CTN testing is intended to:

1. Evaluate the capabilities transferred onto the production system. Determine that the previously tested functionality has not been altered as a function of the transfer.
2. Comments on systems performance and ease of use.
3. Assist the EDCARS PM (if requested) to evaluate the impact on the existing EDCARS system (to the extent resources allow).

Note:

No additional requirements have been placed on the CTN by the EDCARS Program Office, with respect to this User Application Test (as of 12 March 1991).

The presented test script is suggested by the CTN as a modification of the generic test plan outlined by the CTN Test Plan of 24 December 1990. It is presented here as reference material and guide in conducting the EDCARS test:

The CTN test shall:

1. Read Raster Test Suite into the systems.
2. Convert test data to EDCARS data format.
3. Present test data for QA.
4. Annotate each test file to indicate EDCARS acceptance.
5. Release test data to EDCARS for storage.
6. Retrieve test data from EDCARS storage.
7. Retrieve 1 each "A" to "E" EDCARS native unclassified images from EDCARS storage.
8. Present retrieved data for viewing.
9. Queue retrieved data for export.
10. Convert native EDCARS data to CALS format.

11. Write two copies of the retrieved data to CALS media.
12. Read the multi-volume data set into EDCARS.
13. Exchange file D001R001 and D001R005.
14. Write the file set back out to the same tape volumes.
15. Mail a copy of all CALS output to the CTN for evaluation.
16. Mail a copy of all CALS output to AUDRE, Inc. for evaluation.

In the process of handling the data the following issues will be addressed:

1. The system is able to read MIL-STD-1840A tapes.
2. The system can detect erroneous Group-4 encoding.
3. The systems is able to generate valid Group-4 encoding.
4. The system is able to write MIL-STD-1840A tapes.

The CTN representative will provide:

1. A MIL-STD-1840A tape containing the Raster Test Suite.
2. A two volume MIL-STD-1840A tape set containing miscellaneous CALS files.
3. Audit the returned test tape for:
   a. MIL-STD-1840A packaging
   b. MIL-STD-1840A format issues
   c. ANSI X3.27 format issues
   d. MIL-R-28002 issues (returned test suite)
   e. CCITT T.6 encoding

AUDRE, Inc. will provide:

1. Audit and comment on the data interchange procedure.
2. Audit the returned test tape for:
   a. MIL-STD-1840A packaging
   b. MIL-STD-1840A format issues
   c. ANSI X3.27 format issues
   d. MIL-R-28002 issues (native EDCARS data)
   e. CCITT T.6 encoding

EDCARS contractors will provide:

1. (2) MIL-STD-1840A tapes both containing:
   a. annotated test suite files D001R001 to D001R018
   b. native EDCARS files, 1 each "A" to "E" size
2. Shipment of tapes to the test facilities.
   a. Package tapes individually as per MIL-STD-1840A
   b. Ship one to CTNO/LLNL
      Lawrence Livermore National Laboratory
      Att. Nick Mitschkowetz
      Mail Stop L-542
      7000 East Avenue
      Livermore, CA 94550
   c. Ship one to AUDRE, Inc.
      AUDRE, Inc.
      Att: Melody DeJong
      10915 Technology Place
      San Diego, CA 92127

If required by the EDCARS System Program Office, the CTN may provide assistance during the systems revalidation testing process, to the extent that CTN resources allow. Some additional testing capabilities are provided by the CTN (as referenced in the CTN Raster Test Suite) for hard-copy I/O evaluation.

A copy of the CTN Raster Test Suite and the appropriate documentation will be furnished to the Sacramento EDCARS operations management.

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APPENDIX C LAT and UAT Test Notes

TRIP REPORT
LAT TEST EDCARS
Greensboro NC
26-27 February

SUMMARY

The purpose of the trip was to conduct the CTN Bench test or Laboratory Acceptance Test (LAT) in consort with the EDCARS PM acceptance test. Test procedures for the PM acceptance test and the CTN LAT were developed by MAXIMA as required and approved by the EDCARS PM. The MAXIMA test script was substantively the same as the CTN proposed test script. Both tests were conducted in parallel.

Specified functionality delivered by the contractor requires that the system screen import data for a very narrow, pre-defined, set of Hollerith (procedural) data as a prerequisite for image entry into the EDCARS system.

The CALS test strategy requires that "generic" CALS data Loop-through the test system. This method allows the data to pass through all the standard system utilities that would normally be involved in production operations such as data Import, QA, and Export processes (e.g. automated error detection, manual error detection, image preview, image cleanup, red-line capability, etc.--).

The CALS strategy required that a mechanism be provided to process foreign data into the system being tested (CTN test data being foreign, non-EDCARS formatted data). The anticipation was that a test bench system would have the tools and flexibility to easily accept foreign test data.

The newly implemented EDCARS CALS function extracted native EDCARS data, converting it from EDCARS wrap format to MIL-R-28002 format. The data was then written onto two (2) MIL-STD-1840A tapes, one tape shipped to AUDRE, Inc. for analysis and the other hand carried back to the CTNO/LLNL for analysis.

The modified EDCARS system was able to read back in the CALS tape it had generated but was unable to access the CALS data provided by the CTN. The import function rejected the test data at various stages in the automated QA process.

An agreement was reached between the contractor, the EDCARS PM representative, and the CTN representative, that the CALS data throughput test would be conducted at the first installation sight (UAT). The CTN would provide test data that was populated with EDCARS acceptable Hollerith data. The sight manager agreed that his staff would conduct the CALS data throughput test and deliver the CALS data to the CTN for evaluation.

Additionally, it was agreed that the contractor providing the Group-4 encoding technology (WESCO, a subcontractor) would conduct the NIST bench test for Group-4 "compliance".

PURPOSE

The purpose of the test was to conduct development level testing of the EDCARS system by the Modification contractors and the CTNO-DEET.

The EDCARS contract requires test procedures be supplied by the contractor. The contractor test is articulated in the ISEPD Task Order 90-041 EDCARS CALS Conversion Laboratory Acceptance Draft Test Plan (19 November 1990) submitted by MAXIMA.

CTN development level testing is articulated in the CTN Test Plan (24 December 1990) that outlines the "MIL-STD-1840A Testing to Support DSREDS, EDCARS, and EDMICS Compliance with CALS standards".

PARTICIPANTS

Participants included managers and staff from the contractors, the acquisition organization, and the CTN.

Principals in the testing process:

Linda Makinson	AT&T
Bruce	AT&T
Tom	AT&T
Gary Ellis	MAXIMA
Mike Hewitt	WESCO
Dennis Richardson	WESCO
Jerry Kein	EDCARS
Jim Dowty	EDCARS
Joe Gavin	I-NET
Nick Mitschkowetz	CTNO/LLNL

TEST PROCESS

The itinerary was closely scheduled around the MAXIMA test plan that had been submitted as required by contract No. F33600-879-D-0166.

The EDCARS issues were to assess the system modifications in terms of functionality and performance as required by the contract.

The CALS issues were to assess the system's ability to import and export CALS compatible digital data as specified by MIL-STD-1840A, MIL-R-28002 Type I.

CALS TESTING

MAXIMA reviewed test plans and noted that the CALS data must be structured with the appropriate EDCARS procedural information loaded in the source system ID field. Since this had not been done, we anticipated that the CTN Raster Test Suite would fail at QA time.

The original CTN test strategy was to introduce the Raster Test Suite into the EDCARS system in two formats, bit-map and MIL-STD-1840A. The CALS test scenario would convert the bit-map to MIL-STD-1840A and the MIL-STD-1840A files into bit-map data. The resulting data was to be analyzed by the CTNO/LLNL to determine if the conversion processes undertaken as part of the CALS upgrade distorted the data.

As a result of on going testing, the CTN raster test strategy has evolved. It is no longer necessary to introduce a bit-map into a system to assure that the CCITT Group-4 compression algorithms have been applied to the test data.

Through the use of a synthetic hand encoded Group-3 binary sequences and bit-map annotation, it can easily be determined if the target has actually undergone decompression into a bit-map before it is re-compressed into a new Group-4 file. The synthetic encoding can be correctly decompressed into the desired bit-map but must be recompressed using the Group-4 compression algorithm. This strategy allows the CTN to determine that the reference data actually passed through a system, (decompressed and then recompressed) before being exported as new CALS data.

This strategy is much more in line with normal production system functions. It is anticipated that most systems will not have the capability to import bit-map data through a data interchange process. The modified CTN reference MIL-R-28002 Type I data can be looped through a system to demonstrate CALS capabilities. The reference data is structured like normal applications data and lends itself to conventional data interchange procedures.

CTN/EDCARS ISSUES

1. Hollerith data restrictions.
   The EDCARS operational philosophy dictates that the Hollerith data be audited during the CALS import process and that all data failing this audit be summarily rejected as erroneous.

   There is no manual capability provided to over-ride this process which would allow the reconciliation of QA errors encountered during a digital data interchange.

2. Proposed Bit-map test scenario.
   Bit-map data would have to be input through a separate WESCO/Sun system, converted to EDCARS import format data, then imported into the EDCARS test system. The bit-map procedure was eliminated.

3. CALS data format issues.
   For the purposes of this test, the CTN reference data would be read, to evaluate the MIL-STD-1840A tape reading aspects of the system. Additionally, the import processing sequence would allow the EDCARS system to audit the CCITT Group-4 data content.

   Two versions of the Raster Test Suite were presented for evaluation - one with circumflex accent ("^") padding and one with space (" ") padding. The tape written by the CTN Sun raster test bed produced the former, running the public domain utility ANSITAPE, while the CTN VAX raster test bed produced the latter using CTN TAPETOOL utility.

   The VAX also produced another common MIL-STD-1840A format anomaly, that of truncating the last tape block at the end of an image file instead of padding the tape block out to a full 2048 bytes. The EDCARS system was capable of reading the CALS tape with both space (" ") and circumflex accent ("^") padding and a later test indicated that EDCARS could read tapes with short tape blocks.

   Although not strictly in accord with MIL-STD-1840A, the short block anomaly is common and only affects CALS interchanges with systems that are sensitive to short tape blocks.

4. Multiple-tape volume with a file spanning two tapes.
   The AT&T host system is incapable of writing a file that spans two volumes. The contractor explained that the existing ANSI tape utility does not interface with the device driver correctly. When writing to a tape, if the drive encounters the "physical end-of-tape" (EOT) mark, it passes back an error flag indicating an EOT. The ANSI tape utility does not detect this error and attempts to continue writing. This forces the hardware to back up and insert two end-of-record marks, effectively generating a soft end-of-tape.

In applications requiring more than one tape to transfer a quantity of data, the data would have to be divided up and written to separate single-tape volumes. The strategy is to calculate the number of files that would fill but not overrun one tape, then write that data to the tape. This procedure would be repeated till all the interchange data was written to CALS media.

5. Generate CALS data from native EDCARS data.
A CALS tape was generated using native EDCARS data. Two copies were made. One tape to be packed and sent to AUDRE, Inc. and the other tape was hand carried to the CTNO/LLNL for evaluation.

CTN TEST RESOLUTIONS

1. Hollerith data
The CTN will insert EDCARS compatible Hollerith data in the 18 raster reference images to allow this data to be read and released into the EDCARS system. This data will be taken to the McClellan AFB UAT where the CALS Loop-through test will be conducted.

2. NIST Group-4 conformance test
The inflexibility of a finished EDCARS system will not lend itself to the NIST conformance test strategy, for the same reasons that the original CTN bit-map strategy was modified.

The optimum solution is to conduct the NIST conformance test through the original vendor of the Group-4 compression/decompression utility. The developer (WESCO) shall conduct the NIST test at their facility.

LAT TEST NOTES:

9:00AM
Gary Ellis explained the MAXIMA prepared test plan. Gary noted that there are still some problems mapping Hollerith field conversions. I view this as an application problem that doesn't concern the CTN.

9:15AM
Move meeting to AT&T Lab. Start timing tests to convert EDCARS wrap format to CALS format. Part of the EDCARS PM acceptance test. It might be noted that the conversion process converts EDCARS-wrap to WESCO Neutral to CALS-Group-4. Since the WESCO Neutral is not a complete bit-map decompression, it's appropriate that the CTN require a Loop-through with red-line to assure that at some stage in the process the test data is completely decomposed into a bit-map.

Timing test began for "A" to "E" size image conversion from EDCARS wrap to WESCO Neutral to CALS format. The images selected to conduct the test were chosen on the basis of their compressed size through statistical sampling.

image size	CPU-seconds
"A"	21
"B"	57
"C"	78
"D"	110
"E"	202

9:50AM
Reverse timing test to import the same images from CALS back to EDCARS wrap format.

image size	CPU-seconds
"A"	31
"B"	71
"C"	117
"D"	136
"E"	282

10:25AM
Decision was made to readjust the I/O buffers to try and improve the conversion times.

Break

10:50AM
QA operation was conducted to demonstrate the automated QA procedure that has been implemented for the CALS import process.

Under the implementation requirements, the system would not import any CALS data that contained errors.

Since the CTN test data was generic (no EDCARS specific header data was in any of the records), no CTN test data could be moved into the EDCARS system release procedure to complete the Loop-through test.

11:30AM
Set up for 999 image import test. A previously generated tape with 1000 images was loaded and the import process was started. The testers go for lunch.

1:40PM
Returned from lunch; the 999 image test was complete. The QA process was run on the 999 images. All Hollerith were OK. Noncritical header errors are flagged. In order to get data into EDCARS (ANY DATA) the CALS header record-1 must contain MIL-STD-804B "H" formatted Hollerith data with specific content requirements.

2:00PM
System needed to be purged of the 999 images, to make room for the rest of the testing process.

2:10PM
Demo editing capability on noncritical Hollerith data. Critical errors are not correctable and cause data rejection. Errors are reported by field.

3:10PM
Exported native data in a CALS format. Two tapes would be written, one for the CTN to evaluate and one for AUDRE, Inc. to evaluate.

3:40PM
Conversion accuracy test. Read the CALS tape back into EDCARS and compare the new EDCARS files to the original EDCARS files.

Note:

There was some discrepancy in one of the resulting files. However, both images compared visually; there must be a buffering difference.

Note:

Given the system's inability to handle bit-map data, another strategy to perform the NIST Group-4 evaluation will be required.

Next day

9:20AM
I/O buffer fix was installed. Timing test showed "E" at 247 CPU seconds.

11:00AM
CTN test tape read test. Obviously the data will not pass the QA process but the interest here is to sample the variation in MIL-STD-1840A tape formats that the CTN has experienced.

Sun ANSITAPE
5th file failed.
9th file failed.
13th file failed.
Indications are that the AT&T magnetic tape sub-system is sensitive to short tape blocks. (Follow-on testing at Sacramento indicated that the system was not sensitive to short-tape blocks. In the absence of the original test data, these tape read errors are irreconcilable.)

VAX TAPETOOL
Tape read failed on the Declaration file; tape block was too short. The CTN VAX system must still be truncating tape blocks.

VAX multiple tape could not be read due to short Declaration file. This is a non issue since the system is incapable of reading past the EOT reflector.

11:30AM
More I/O buffer issues and timing issues, selecting a trade off between I/O buffer size and degrading swap space on disk. More EDCARS to CALS tests.

1:06PM Lunch

1:20PM
Finish import CALS to EDCARS, this time audit detected no problems.
System will not read or write a multiple tape set. IBM is not capable of writing past the END-OF-TAPE reflector.

The CTN will take back the Native EDCARS data, generated for the EDCARS-to-CALS/CALS-to-EDCARS test, for analysis.

I will implement a special CTN test data set with EDCARS acceptable Hollerith data in record-1 of the CALS headers.

TRIP REPORT
USER APPLICATION TEST EDCARS
Sacramento, CA
13 March 1991

1. Test Summary: .

The purpose of the trip was to observe and participate in a continuation of the Development Level Testing and the first User Application Test of the EDCARS System modifications made under contract No. F33600-89-D-0166.

Testing was to proceed at the first installation site at McClellan AFB in Sacramento CA. As in the Development Level Test, the procedures were developed by MAXIMA and approved by the EDCARS PM. Again, contractor testing centered around functionality and performance issues identified by the SOW. The intent of the testing was to demonstrate the same performance on a production system as was demonstrated on the development system.

The CTN strategy was to complete the data Loop-through test started during the Development Level Test. The CTN raster reference data had been modified to provide EDCARS procedural Hollerith data in the "srcdocid: " field, commensurate with the data format provided by MAXIMA.

The MIL-STD-1840A tape generated on the CTN-Sun platform was successfully read into the EDCARS CALS import utility. The initial QA process correctly located and parsed out the 18 MIL-R-28002 image files and correctly flagged file D001R013 as having a Group-4 encoding error.

Successive attempts to import the 18 images into the EDCARS system failed for a variety of reasons. Apparently, the data map used by the CTN to modify the reference image headers was in error. The intentionally flawed image (D001R013) had inadvertently been included, and files larger than "E" size were still present.

Each failure precipitated a fix or an image rejection. The fix involved a rather laborious editing process using a systems utility to patch the appropriate ASCII data into the image headers. Eventually, eleven (11) of the 18 original images were accepted by the system, released onto the optical disk and subsequently exported out of EDCARS onto a MIL-STD-1840A tape.

It was agreed that an additional test should be conducted in two weeks, using a version of the CTN reference data which contained only image data capable of passing the EDCARS QA requirements. This test will repeat the above process without image rejection or manual intervention.

2. User Application Test Issues

The CALS import QA process was capable of uncovering errors such as erroneous Hollerith data, image sizes incompatible with the EDCARS system, unacceptable compression ratios, and bad Group-4 compression.

The Hollerith data was introduced into the Raster Reference Data at LLNL using documentation provided by MAXIMA. In checking the documentation, it was discovered that the original FAX from WESCO to MAXIMA had dropped out a line of text. The quality of the FAX had led to a misinterpretation of the required Hollerith data format.

Another version of the Raster Reference Data will be produced at Livermore containing the correct Hollerith formatted data.

The image size issue has two facets. One, the EDCARS system is only geared to accept "E" size drawing frames. Roll drawings ("J" sizes) must be provided as several independent images, each representing a frame. Image D001R014 is a monolithic "J" size image and is not compatible with EDCARS functionality. Additionally, the ISO "A0" drawing frame overlays an "E" and is also too large for EDCARS. These oversized images will be removed from the CTN/EDCARS raster test.

The second size issue deals with the allocation of EDCARS system memory. During the import process, the EDCARS system attempts to determine how much space will be required for image processing. The current estimation mechanism assumed a particular compression efficiency. At QA time, the compression of an image is calculated by comparing the calculated bit-map to the actual Group-4 data. Images that fall short of the expected compression are not imported into EDCARS.

Two CTN images fell below the threshold and were rejected. EDCARS will change the compression threshold before the next test. The 11 files that could be manually modified, passed through and were successfully released into the EDCARS system and written to optical disk. This same data was subsequently retrieved from the EDCARS system and written out as CALS data.

The anticipation is that the EDCARS system will be able to import single tape volumes that are generated strictly according to the MIL-STD-1840A standard, and that contain the required EDCARS procedural information. However, the complete analysis will have to wait for the conclusion of the Texas test.

WESCO concedes that given the current AT&T systems configuration (tape drive system I/O calls), the capability to accept and produce multiple tape volumes, as specified by MIL-STD-1840A, is not possible. The multiple-tape read/write test will not be conducted on the current EDCARS configuration.

3. Continuing Testing

The CTN data-loop test will be conducted again at the second EDCARS installation (in Texas, in two weeks). This test will include:

a. Reading in the new modified EDCARS/CTN Raster Reference Data.
b. Parsing the MIL-R-28002 files out of the MIL-STD-1840A tape format.
c. Converting the CALS data to EDCARS import format.
d. Performing the QA process on the EDCARS import data.
e. Releasing the data onto the EDCARS optical storage media.
f. Retrieving the data and forming the EDCARS optical storage media.
g. Annotating every image with the character string "EDCARS" in the lower right corner of the image.
h. Exporting the images as CALS data, sending tapes back to AUDRE, Inc. and CTNO/LLNL for evaluation.

From the CTN perspective, this process can be handled remotely, and does not require CTN participation. A new raster data tape will be submitted to MAXIMA for the test.

4. ATTENDED BY:

Principals in the testing process:

Linda MaKinson	AT&T
Bruce	AT&T
Gary Ellis	MAXIMA
Mike Hewitt	WESCO
Dennis Richardson	WESCO
Jerry Kein	EDCARS
Jim Dowty	EDCARS
Joe Gavin	I-NET
Nick Mitschkowetz	CTNO/LLNL
Melody DeJong	AUDRE, Inc.

5. UAT TEST NOTES

8:30AM
Test was already underway when I arrived. The 999 image test had been started the evening before.

9:05AM
QA of images was completed. The system had to be purged of excess test data.

9:40AM
EDCARS-to-CALS, 20 image transfer.

10:00AM
CTN test tape input.

VAX TAPETOOL tape still would not tread. A short Declaration file was detected.

Sun ANSITAPE read OK. Image QA detected bad encoding on D001R013. This was in fact the image with an introduced anomaly. Images larger than "E" were rejected.

QA also detected Hollerith errors. The data map I had used to introduce EDCARS acceptable header data was flawed.

10:30AM
The imported CALS data in WESCO-Neutral format was written back to CALS-format and compared with the original tape.

10:45AM
Check tape-to-tape, file differences were found in several images. The difference is at the end of all the files and doesn't effect the image. This is some sort of buffering anomaly which simply extends the end of the file.

Note:

A. It was agreed that a complete Loop-through test would be undertaken at San Antonio. Input for the test would be provided by the CTN. For this input I will have to:

1. Remove image D001R013. The system has already demonstrated that the Automated QA system does detect the erroneous encoding.
2. Remove all images larger than "E" size. The "J" and the "ISO-A0" images will have to be removed.
3. Correct the EDCARS Hollerith header information.

I will mail the Tape to Gary Ellis who will hand carry it to the Texas test meeting. The system being tested will conduct the Loop-through test and transfer the results back to me at LLNL for analysis.

B. Because of the tape driver problem, there does not appear to be any sense in continuing with a multi-volume tape test. Mike Hewitt assures me that the IBM is incapable of writing past the END-OF-TAPE reflector which obviates ANSI X3.27 multi-tape capability.

APPENDIX D Follow-on Testing

(Follow-on Test conducted at the San Antonio EDCARS installation)

A Follow-on Test was conducted to accomplish a complete Loop-through test without QA anomalies.

CTN reference data had previously been rejected for release into the EDCARS system during the LAT because the data provided in header record 1 (srcdocid:) did not fulfill the EDCARS QA requirement. At that time the Loop-through test had been postponed and would be re-attempted during the UAT.

Required EDCARS header data was mapped out by the Contractor and FAXed to the CTNO/LLNL for incorporation into the UAT raster reference data set. Due to FAX transmission errors the data map was in error. As a result, the reference data provided by the CTN at the EDCARS UAT also failed QA, and the Loop-through test was again rescheduled, this time as a Follow-on Test to be conducted at the San Antonio EDCARS installation.

The Follow-on Test scenario for San Antonio simply required the participants to:

1. Read the CALS reference data tape.
2. Convert the MIL-R-28002 raster data to EDCARS format.
3. Present the import data for QA.
4. Release the data to the EDCARS system.
5. Annotate the first 5 images on the tape with an EDCARS identification mark.
6. Export the annotated images to a CALS magnetic tape.
7. Transfer the data to the CTN for evaluation.

The reference data set consisted of the same data set provided at the LAT and UAT without the images larger than a North American "E" size frame or the image that had the intentional Group-4 error. Additionally, the correct EDCARS procedural data had been implemented in the header of each MIL-R-28002 file. The strategy was to provide EDCARS with a complete CALS data set that would clear the QA process.

The tape was mailed to a representative of the contractor who would implement the Follow-on Test during the EDCARS acceptance test being conducted at San Antonio.

The CTN made the assumption that since the same software would be implemented at each EDCARS site, the software being implemented at San Antonio would be identical in functionality to the software implemented at the LAT and UAT sites.

It was agreed that the CTN did not require representation at the test, in that the annotations and the synthetic Huffman encoded files would indicate that the CTN reference data had, indeed, passed through the system and was processed as required by the CTN Loop-through test scenario.

The data returned to the CTN was read into both the Sun and VAX test bed systems at the CTNO/LLNL. All the images on the tape were successfully decompressed and displayed by the CALSTB.350 utility on the Sun.

Further analysis indicated that the synthetic Huffman encoded run-lengths had been successfully decoded and re-encoded. Additionally, most of the images had the text string "EDCARS REVIEWED" place in or near the title block. The annotation further indicated that the image had been successfully decompressed into a bit-map before being recompressed and written onto a CALS formatted tape.

However, analysis of the file structure indicated that almost all the MIL-R-28002 files had been written with the last tape block of each file truncated at the end of the Group-4 binary data.

The MIL-STD-1840A requires that all tape blocks be written out to a full 2048 bytes in length. The last tape block of a binary file must be padded to eliminate short blocks. Although this anomaly did not cause a problem for the CTN test beds, it had been determined by NIST that some systems may have problems reading short tape blocks, especially at the higher tape densities.

In the CTN's experience, it is possible to effect the short tape block anomaly by implementing the appropriate software parameters. This situation was observed on both CTN VAX and Sun CALS tape implementations using the TAPETOOL utility.

In the EDCARS scenario, two possibilities exist. The anomaly is either implementation dependent or operationally dependent. The former alternative would dictate that the San Antonio CALS software is not identical to the EDCARS LAT and UAT implementations, while the latter alternative would dictate that an operational parameter can influence magnetic tape blocking, indicating that the operator conducting the test caused the anomaly.

All the EDCARS tapes returned to the CTN contained some minor discrepancies in procedural data;

a. Declaration file containing an incorrect file count,
b. Confusing revision level identification,
c. Erroneous destination specifications,
d. Erroneous orientation parameters,
e. Invalid ANSI tape name.

Here issues can be attributed directly to operations procedures as opposed to system functionality.

The CTN assumes that the EDCARS Program is monitoring the software revision and upgrade implementation of the EDCARS systems as part of the overall EDCARS QA strategy. In this case the most reasonable conclusion is that the block length anomaly was introduced by an operator not familiar with the CALS application.

The implementation of operating procedures is governed by the applications which require the digital data interchanges. It must be recognized that the EDCARS systems which conducted the tests are not in a "CALS production" mode. The tests were conducted by systems development personnel, presumably no operations personnel had been trained in CALS production procedures.

The CTN recommends that, before further data interchanges are conducted by EDCARS, the procedures required to generate CALS data be established and provided in a production oriented checklist for personnel conducting CALS data interchange exercises.

Additionally, the CTN recommends that the EDCARS Program Office and the Contractor audit the software revisions at the three test sites to assure their coincidence.

Predicated on software coincidence, CTN analysis indicates that the EDCARS CALS implementation is technically capable of accomplishing CALS MIL-STD-1840A single-tape volume, MIL-R-28002 Type I, digital raster data interchanges with other "CALS-ready" systems.

A copy of the related correspondence with respect to the Follow-on Test is attached.

APPENDIX E Acronyms and Standards

Acronyms Expanded

ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
AT&T	American Telephone and Telegraph
AUDRE, Inc.	Contractor
BOT	Beginning of Tape
BPI	Bits Per Inch
CALS	Computer-aided Acquisition and Logistic Support
CCITT	Comite Consultatif Internationale de Telegraphique et Telephonique (English: International Consultative Committee on Telegraphy and Telephony)
CPU	Central Processing unit
CTN	CALS Test Network
CTNO	CALS Test Network Office
DEC	Digital Equipment Corporation
DEETT	DSREDS, EDCARS, and EDMICS Test Team
DLA	Defense Logistics Agency
DoD	Department of Defense
DSREDS	Army, Digital Storage and Retrieval Engineering Data System
DTRC	David Taylor Research Center
EDCARS	Air Force, Engineering Data Computer-Assisted Retrieval System
EDMICS	Navy, Engineering Data Management Information and Control System
EOT	End of Tape
I/O	Input/Output
IBM	International Business Machines
JCMO	Joint CALS Management Office
LAN	Local Area Network
LAT	Laboratory Acceptance Test
LLNL	Lawrence Livermore National Laboratory
MAXIMA	Prime Contractor
MB	Megabyte
NIST	National Institute of Standards and Technology
OSD	Office of the Secretary of Defense
PM	Program Manager
QA	Quality Assurance
QSTR	Quick Short Test Report
RLE	Run-Length Encoded
SOW	Statement of Work
TCP/IP	Transmission Control Protocol/Internet Protocol
TISP	Technology Information Systems Program
UAT	User Applications Test
UNIX	(A name, not an acronym -- originally printed in "all small caps")
VAX	Virtual Address Extension (DEC)
VMS	Virtual Memory System (DEC)
WESCO	Sub-Contractor

Standards Referenced

ANSI X3.27	American National Standards Institute Inc. "Magnetic tape labels and file structure for information interchange"
ASTM-D-3951	American Society for Testing and Materials "Standards for Commercial Packaging"
CCITT Recommendation T.6	International Telecommunication Union VII.3
MIL-HDBK-59A	
MIL-R-28002	Raster Graphic Representation in Binary Format
MIL-STD-1840A	Automated Interchange of Technical Information
PPP-B-636	
MIL-STD-804B	